IEc

ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE CALIFORNIA RED-LEGGED FROG

Draft | March 3, 2009

prepared for:

U.S. Fish and Wildlife Service

4401 N. Fairfax Drive

Arlington, VA 22203

prepared by:

Industrial Economics, Incorporated

2067 Massachusetts Avenue

Cambridge, MA 02140

INDUSTRIAL ECONOMICS, INCORPORATED

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LIST OF ACRONYMS

Act	Endangered Species Act
AUMs	animal unit months
BEC	Berkeley Economic Consulting
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
CA DFG	California Department of Fish and Game
Caltrans	California Department of Transportation
CARS	critical aquatic refuges
CCA	California Coastal Act
CDPR	California Department of Parks and Recreation
CFPR	California Forest Practice Rules
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHD	critical habitat designation
CNDDB	California Natural Diversity Data Base
CTIS	California Transportation Investment System
CWA	Clean Water Act
DOI	U.S. Department of the Interior
ECCHCP	East Contra Costa County HCP
EIR	Environmental Impact Report
E.O.	Executive Orders
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESHAs	environmentally sensitive habitat areas
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMMP	Farmland Mapping & Monitoring Program
frog	California red-legged frog

FWS	Fish and Wildlife Service
HCP	Habitat Conservation Plan
IEC	Industrial Economics, Inc.
IRFA	Initial Regulatory Flexibility Analysis
IUDA	initial urban development area
MSHCP	Multiple Species Habitat Conservation Plan
MUDA	maximum urban development area
NAICS	North American Industry Classification System
NASS	National Agriculture Statistics Service
NRCS	Natural Resources Conservation Service
NGOs	non-governmental agencies
OMB	U.S. Office of Management and Budget
PCEs	primary constituent elements
RCA	riparian conservation area
RFA	Regulatory Flexibility Act
RPF	Registered Professional Forester
SBA	U.S. Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
Service	U.S. Fish and Wildlife Service
SNFPA	Sierra Nevada Forest Plan Amendment
THP	Timber Harvest Plan
USACE	U.S. Army Corps of Engineers
USFS	U.S. Forest Service
WHIP	Wildlife Habitat Incentives Program
WLPZ	watercourse and lake protection zone
WUI	Wildlife-Urban Interface

EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts resulting from the proposed critical habitat designation for the California red-legged frog (*Rana aurora draytonii*, hereafter, "frog"). This report was prepared by Industrial Economics, Incorporated (IEc) and Berkeley Economic Consulting (BEC) under contract to the U.S. Fish and Wildlife Service (Service).

OVERVIEW OF THE PROPOSED RULE

2. The frog was listed as threatened under the Endangered Species Act (Act) on May 23, 1996. Subsequently, the Service designated critical habitat on March 13, 2001 and revised the designation on April 13, 2006.[1] Then on December 12, 2007, the Center for Biological Diversity filed a complaint against the Service challenging the 2006 revision. In April 2008, the court entered a consent decree requiring a revised critical habitat rule by August 2009. On September 16, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the frog.[2] This economic analysis evaluates the likely economic impacts of the September 16, 2008 proposed rule. A map of the proposed critical habitat is presented in ES-1.

3. The 50 proposed critical habitat units cover approximately 1.8 million acres across 28 counties in California. These proposed critical habitat units (the study area) include: approximately 70 percent private lands; 21 percent Federal lands; 7 percent State lands; two percent owned by city, county, or other local entities; and less than one percent owned by conservation groups (e.g., The Nature Conservancy) and non-governmental agencies (NGOs). All of the proposed units are considered to be currently occupied by the frog.[3]

4. The Service is considering for exclusion six acres covered by the Bonny Doon Quarries Settlement Ponds Habitat Conservation Plan (HCP), 4,097 acres of non-Federal land within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), 92,592 acres of local land covered by the East Contra Costa County HCP, 8292 acres of local land managed by the East Bay Regional Park District and 54 acres of

[1] 66 FR 14626; 71 FR 19244

[2] 73 FR 53492.

[3] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the California Red-Legged Frog (*Rana aurora draytonii*); Proposed Rule, published in the *Federal Register* on September 16, 2008, Vol. 73, No. 180.

Federal land managed by the U.S. Bureau of Land Management (BLM) under the Spivey Pond Management Plan.[4]

5. This analysis describes economic impacts of frog conservation efforts associated with the following categories of activity: (1) Residential and Commercial Development, (2) Water Management, (3) Agriculture, (4) Ranching/Grazing, (5) Timber Harvest, (6) Transportation, (7) Fire Management, (8) Utility and Pipeline Construction and (9) Habitat Management. Forecast impacts are organized into two categories according to "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the frog; for example, protections provided under the Federal and State listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated economic impacts would not occur but for the designation. This analysis also looks at indirect costs that are the result of the influence of critical habitat designation upon other, non-Federal decision-makers. Because the Service believes that the direct benefits of the proposed rule are best expressed in biological terms, this analysis does not quantify or monetize benefits. However, a qualitative discussion of potential categories of benefits is provided at the end of the report.

6. Key findings of this analysis are presented below.[5] Throughout the report, impacts occurring prior to the finalization of this proposed rule (1996 – 2008) are referred to as "pre-designation" impacts. Likewise, impacts anticipated to occur after publication of the final rule (2009 – 2030) are referred to as "post-designation" impacts. Post-designation impacts may occur in the baseline or be attributed incremental to the designation.

7. A summary of post-designation impacts is presented in Exhibit ES-2, and total impacts by activity are presented in Exhibit ES-3. Detailed post-designation baseline and incremental impacts are presented by unit and activity in Exhibits ES-4 and ES-5, respectively. Exhibits ES-6 and ES-7 present the distribution of baseline and incremental impacts on development activities by proposed critical habitat unit. Exhibit ES-8 presents the distribution of overall incremental impacts by unit. Finally, Exhibit ES-9 provides incremental impact rankings for the top 20 subunits.[6]

[4] Chapter 1 provides detailed maps of all units, including areas considered for exclusion.

[5] As previously discussed, three existing HCPs, the Western Riverside MSHCP, the East Contra Costa County HCP and the Bonny Doon Quarries Settlement Pond Habitat Conservation Plan include conservation measures for the frog within acres considered for exclusion. For areas covered by these HCPs, frog conservation efforts are unlikely to be altered by the designation of critical habitat, therefore costs associated with implementing these conservation efforts would be attributed to the baseline. Ideally, this analysis would quantify the future baseline protections measures undertaken for the frog in the area of critical habitat within the boundaries of existing HCPs. It is anticipated that any information received during the public comment period regarding the characterization and cost of project modifications required by these plans will be included in the final version of this report.

[6] A subunit is defined by a unique combination of a proposed critical habitat unit and a census tract.

8. Present value costs by time period and activity are presented throughout the report applying a discount rate of seven percent; the report tables are repeated in Appendix C applying a discount rate of three percent. Appendix D presents the undiscounted stream of impacts. Appendix B presents impacts by subunit. Administrative costs of consultations under section 7 of the Endangered Species Act (the Act) are incorporated into each Chapter corresponding to the activity for which the consultations are undertaken.

KEY FINDINGS

Post-designation Baseline Impacts: Baseline impacts associated with consideration of the frog and its habitat are estimated to be $2.38 billion to $2.50 billion ($180 million to $188 million on an annualized basis), assuming a three percent discount rate, or $1.65 billion to $1.74 billion ($152 million to $160 million on an annualized basis), assuming a seven percent discount rate, through the year 2030.

Detailed Baseline Impacts: In the high-end scenario, impacts to development represent approximately 73 percent of total impacts, followed by agricultural impacts, which account for most of the remaining costs. Impacts to all other activities represent less than one percent of the total.

- Development: Development impacts are estimated to be $1.27 billion to $1.83 billion, depending on the discount rate. The largest cost expected in the post-designation period results from delayed construction during the section 7 consultation process and indirectly from the CEQA review process; these impacts are estimated to be $251 million and $836 million, respectively, assuming a seven percent discount rate.

- Agricultural Activities: Agricultural conservation efforts are estimated to be $464 million to $667 million, depending on the discount rate. Costs stem from lost agricultural production resulting from the implementation of no-pesticide use areas for 66 pesticide active ingredients in the study area, as required by a Stipulated Injunction issued on October 20, 2006.

- Other Activities: Baseline impacts to water management, transportation, utility and oil and gas pipelines, timber harvest, fire management, and habitat management constitute about 0.44 percent of total baseline impacts, or approximately $7.64 million, assuming a seven percent discount rate. Activities associated with these impacts include frog survey and monitoring, and administrative cots of consultation and are often due to the presence of the frog or other pre-existing conditions.

Post-designation Incremental Impacts: Incremental impacts associated with the designation of critical habitat for the frog are estimated to be $1.04 billion to $1.10 billion ($93.7 million to $97.9 million on an annualized basis), assuming a three percent discount rate, or $721 million to $767 million ($67.9 million to $72.0 million annualized), assuming a seven percent discount rate, through the year 2030.

Detailed Incremental Impacts: In the high-end scenario, impacts to development represent 78 percent of total impacts, followed by agricultural impacts, which account for 22 percent. Impacts to all other activities represent less than one percent of the total.

- Development: Residential development conservation effort costs are estimated to be from $597 million to $860 million, depending on the discount rate. The largest cost expected in the post-designation period results from delayed construction during the section 7 consultation process and indirectly from the CEQA review process; these impacts are estimated to be $126 million and $421 million, respectively, assuming a seven percent discount rate.

- Agriculture Activities: Agricultural conservation efforts are estimated to be $169 million to $244 million, depending on the discount rate.

- Other Activities: Incremental impacts to water management, transportation, utility and oil and gas pipelines, timber harvest, fire management, and habitat management constitute about 0.08 percent of total incremental impacts, or approximately $640,000 assuming a seven percent discount rate. Activities associated with these impacts are primarily administrative in nature.

Census Tracts with the Highest Impacts

Baseline Impacts: Census tract 06013355104 (within proposed Unit CCS-2) has the largest baseline impacts of the areas considered for designation, $188 million under the high-end scenario, assuming a discount rate of seven percent.

Incremental Impacts: Census tract 06001451101 (within proposed Unit ALA-2) has the largest incremental impacts of the areas considered for designation, $86.5 million under the high-end scenario, assuming a discount rate of seven percent.

EXHIBIT ES-1 REVISED PROPOSED CRITICAL HABITAT

EXHIBIT ES-2 SUMMARY OF POST-DESIGNATION IMPACTS (PRESENT VALUE, 2008 DOLLARS)

	THREE PERCENT DISCOUNT RATE		SEVEN PERCENT DISCOUNT RATE	
	LOW SCENARIO	HIGH SCENARIO	LOW SCENARIO	HIGH SCENARIO
IMPACTS ATTRIBUTED TO EXISTING, BASELINE REGULATIONS				
Present Value Impacts	$2,380,000,000	$2,500,000,000	$1,650,000,000	$1,740,000,000
Annualized Impacts	$180,000,000	$188,000,000	$152,000,000	$160,000,000
IMPACTS ATTRIBUTED INCREMENTALLY TO CRITICAL HABITAT DESIGNATION (THE PROPOSED RULE)				
Present Value Impacts	$1,040,000,000	$1,100,000,000	$721,000,000	$767,000,000
Annualized Impacts	$93,700,000	$97,900,000	$67,900,000	$72,000,000
Note: Totals may not sum due to rounding.				

EXHIBIT ES-3 SUMMARY OF POST-DESIGNATION, HIGH-END IMPACTS BY ACTIVITY (2008 DOLLARS, ASSUMES A SEVEN PERCENT DISCOUNT RATE)

ACTIVITY	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS
Development	$1,270,000,000	73%	$597,000,000	78%
Water Management	$2,730,000	0%	$172,000	0%
Agriculture	$464,000,000	27%	$169,000,000	22%
Grazing	$0	0%	$267,000	0%
Timber Harvest	$73,400	0%	$10,300	0%
Transportation	$2,080,000	0%	$25,400	0%
Fire Management	$23,000	0%	$39,000	0%
Utility & Pipeline	$2,280,000	0%	$57,300	0%
Species Management	$454,000	0%	$68,500	0%
Total	**$1,740,000,000**	**100%**	**$767,000,000**	**100%**

EXHIBIT ES-4 SUMMARY OF POST-DESIGNATION BASELINE IMPACTS BY UNIT AND ACTIVITY: HIGH-END SCENARIO (PRESENT VALUE, 2008 DOLLARS, SEVEN PERCENT)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$63,700,000	$15,000	$0	$0	$0	$0	$0	$20	$63,700,000
ALA-1B	$45,200,000	$58,300	$0	$0	$0	$0	$0	$55	$45,200,000
ALA-2	$129,000,000	$129,000	$2,280,000	$0	$0	$0	$152,000	$1,530	$132,000,000
BUT-1	$0	$40,700	$0	$47,500	$0	$12,000	$0	$46,800	$147,000
CAL-1	$8,410,000	$27,100	$0	$0	$0	$0	$0	$0	$8,440,000
CCS-1	$344,000	$74,700	$1,070,000	$0	$0	$0	$76,000	$97	$1,560,000
CCS-2	$461,000,000	$229,000	$127,000,000	$0	$561,000	$0	$228,000	$924	$589,000,000
ELD-1	$8,440,000	$40,700	$282,000	$4,150	$0	$0	$0	$83,000	$8,850,000
LOS-1	$0	$27,100	$0	$0	$0	$9,000	$0	$5,950	$42,100
MEN-1	$64,000	$54,300	$0	$0	$0	$0	$0	$0	$118,000
MNT-1	$31,900	$27,400	$54,700	$0	$0	$0	$0	$50	$114,000
MNT-2	$22,500,000	$135,000	$11,900,000	$0	$832,000	$0	$76,000	$11,700	$35,500,000
MNT-3	$28,600	$66,700	$5,330,000	$0	$0	$0	$0	$2,760	$5,430,000
MRN-1	$1,750,000	$13,600	$20,600,000	$0	$0	$0	$0	$1,230	$22,400,000
MRN-2	$168,000	$27,100	$3,200,000	$0	$0	$0	$0	$3,560	$3,400,000
MRN-3	$1,220,000	$54,300	$967,000	$0	$0	$0	$0	$5,360	$2,240,000
NAP-1	$444,000	$13,600	$2,900,000	$0	$0	$0	$0	$0	$3,350,000
NEV-1	$3,970,000	$54,300	$2,220,000	$11,500	$0	$715	$0	$57,300	$6,310,000
PLA-1	$526,000	$47,900	$0	$4,040	$0	$0	$0	$25,700	$603,000
RIV-1	$1,580,000	$40,700	$3,550,000	$0	$0	$0	$0	$0	$5,170,000
SCZ-1	$121,000,000	$111,000	$80,800,000	$0	$70,000	$0	$76,000	$65,300	$202,000,000
SCZ-2	$85,900,000	$43,200	$63,700,000	$0	$70,000	$0	$0	$3,810	$150,000,000
SLO-1	$8,990,000	$31,200	$2,070,000	$0	$0	$0	$152,000	$11,500	$11,300,000
SLO-2	$50,400,000	$72,900	$17,000,000	$0	$0	$0	$76,000	$9,220	$67,600,000
SLO-3	$96,700,000	$115,000	$12,500,000	$0	$290,000	$0	$152,000	$9,970	$110,000,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SLO-4	$0	$50,200	$9,750	$0	$0	$0	$0	$3,000	$62,900
SNB-1	$924,000	$45,600	$5,720,000	$0	$0	$0	$0	$970	$6,690,000
SNB-2	$2,780	$15,900	$154,000	$0	$0	$0	$76,000	$464	$249,000
SNB-3	$79,300	$49,300	$58,300	$0	$0	$0	$76,000	$1,710	$265,000
SNM-1	$23,000,000	$104,000	$5,180,000	$0	$0	$0	$76,000	$225	$28,400,000
SNM-2	$54,300,000	$132,000	$35,500,000	$0	$0	$0	$0	$1,410	$89,900,000
SOL-1	$6,480,000	$13,600	$19,100	$0	$0	$0	$76,000	$0	$6,590,000
SOL-2	$1,110,000	$13,600	$8,160	$0	$0	$0	$76,000	$0	$1,210,000
SOL-3	$6,770,000	$27,100	$6,630,000	$0	$0	$0	$76,000	$0	$13,500,000
SON-1	$135,000	$27,100	$97,500	$0	$0	$0	$0	$0	$260,000
SON-2	$204,000	$13,600	$5,070	$0	$0	$0	$0	$0	$223,000
SON-3	$2,330,000	$27,100	$2,940,000	$0	$0	$0	$0	$122	$5,300,000
STB-1	$0	$34,400	$0	$0	$0	$0	$0	$4,160	$38,600
STB-2	$9,020,000	$37,500	$5,820,000	$0	$0	$0	$76,000	$5,580	$15,000,000
STB-3	$0	$54,400	$13,400	$0	$0	$0	$0	$7,870	$75,800
STB-4	$0	$29,700	$0	$0	$0	$0	$0	$1,350	$31,000
STB-5	$45,700	$44,400	$2,710	$0	$253,000	$0	$152,000	$2,020	$500,000
STB-6	$6,800,000	$44,200	$6,660,000	$0	$0	$0	$152,000	$1,880	$13,700,000
STB-7	$13,100	$110,000	$33,400	$0	$0	$0	$76,000	$27,800	$260,000
STC-1	$8,450,000	$61,200	$13,500,000	$0	$0	$0	$76,000	$205	$22,100,000
STC-2	$34,900,000	$102,000	$9,190,000	$0	$0	$0	$76,000	$2,400	$44,200,000
VEN-1	$636,000	$17,700	$12,100,000	$0	$0	$0	$76,000	$1,330	$12,800,000
VEN-2	$0	$34,500	$0	$0	$0	$1,280	$0	$7,490	$43,300
VEN-3	$0	$61,300	$3,370,000	$0	$0	$0	$152,000	$2,280	$3,590,000
YUB-1	$1,030,000	$27,100	$0	$6,220	$0	$0	$0	$36,100	$1,100,000
Total	**$1,270,000,000**	**$2,730,000**	**$464,000,000**	**$73,400**	**$2,080,000**	**$23,000**	**$2,280,000**	**$454,000**	**$1,740,000,000**

Note: Totals may not sum due to rounding.

EXHIBIT ES-5 SUMMARY OF POST-DESIGNATION INCREMENTAL IMPACTS BY UNIT AND ACTIVITY: HIGH-END SCENARIO (PRESENT VALUE, 2008 DOLLARS, SEVEN PERCENT)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$4,620,000	$489	$0	$5,830	$0	$0	$0	$0	$7	$4,630,000
ALA-1B	$53,800,000	$1,340	$0	$16,200	$0	$0	$0	$0	$18	$53,800,000
ALA-2	$93,200,000	$15,700	$239,000	$245,000	$0	$0	$0	$3,820	$510	$93,700,000
BUT-1	$0	$0	$0	$0	$2,570	$0	$0	$0	$0	$2,570
CAL-1	$8,620,000	$0	$0	$0	$0	$0	$0	$0	$0	$8,620,000
CCS-1	$3,670,000	$2,290	$561,000	$0	$0	$0	$0	$1,910	$32	$4,240,000
CCS-2	$59,400,000	$21,900	$8,320,000	$0	$0	$6,870	$0	$5,730	$308	$67,800,000
ELD-1	$11,100,000	$0	$1,200,000	$0	$1,380	$0	$0	$0	$0	$12,300,000
LOS-1	$0	$0	$0	$0	$0	$0	$3,000	$0	$1,990	$4,990
MEN-1	$10,000,000	$0	$0	$0	$0	$0	$0	$0	$0	$10,000,000
MNT-1	$0	$78	$0	$0	$0	$0	$0	$0	$17	$95
MNT-2	$27,200,000	$18,000	$4,590,000	$0	$0	$10,200	$0	$1,910	$3,910	$31,800,000
MNT-3	$76,900	$4,150	$2,690	$0	$0	$0	$0	$0	$919	$84,600
MRN-1	$650,000	$0	$6,550,000	$0	$0	$0	$0	$0	$411	$7,200,000
MRN-2	$2,350,000	$0	$36,100,000	$0	$0	$0	$0	$0	$1,190	$38,500,000
MRN-3	$1,140,000	$0	$914,000	$0	$0	$0	$0	$0	$1,790	$2,050,000
NAP-1	$62,900	$0	$115,000	$0	$0	$0	$0	$0	$0	$177,000
NEV-1	$6,010,000	$0	$2,020,000	$0	$3,010	$0	$24,600	$0	$0	$8,060,000
PLA-1	$111	$2,410	$0	$0	$1,350	$0	$11,000	$0	$0	$14,900
RIV-1	$98,900	$0	$402	$0	$0	$0	$0	$0	$0	$99,300
SCZ-1	$17,800,000	$14,300	$15,200,000	$0	$0	$858	$0	$1,910	$21,800	$33,100,000
SCZ-2	$1,300,000	$822	$2,340,000	$0	$0	$858	$0	$0	$1,270	$3,640,000
SLO-1	$7,080,000	$1,370	$1,610,000	$0	$0	$0	$0	$3,820	$3,820	$8,700,000
SLO-2	$37,100,000	$10,800	$12,600,000	$0	$0	$0	$0	$1,910	$3,080	$49,700,000
SLO-3	$93,200,000	$11,200	$12,500,000	$0	$0	$3,550	$0	$3,820	$3,320	$106,000,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SLO-4	$3,260,000	$3,160	$1,040,000	$0	$0	$0	$0	$0	$1,000	$4,310,000
SNB-1	$580,000	$1,630	$3,420,000	$0	$0	$0	$0	$0	$323	$4,000,000
SNB-2	$5,420	$780	$1,700	$0	$0	$0	$0	$1,910	$155	$9,970
SNB-3	$1,770,000	$2,880	$3,600,000	$0	$0	$0	$0	$1,910	$571	$5,380,000
SNM-1	$12,900,000	$2,850	$3,640,000	$0	$0	$0	$0	$1,910	$75	$16,600,000
SNM-2	$63,000,000	$7,930	$15,300,000	$0	$0	$0	$0	$0	$471	$78,300,000
SOL-1	$1,390,000	$0	$286,000	$0	$0	$0	$0	$1,910	$0	$1,680,000
SOL-2	$1,890,000	$0	$4,890,000	$0	$0	$0	$0	$1,910	$0	$6,780,000
SOL-3	$2,120,000	$0	$1,190,000	$0	$0	$0	$0	$1,910	$0	$3,310,000
SON-1	$21	$0	$154	$0	$0	$0	$0	$0	$0	$175
SON-2	$202,000	$0	$161	$0	$0	$0	$0	$0	$0	$202,000
SON-3	$159,000	$0	$46,200	$0	$0	$0	$0	$0	$41	$205,000
STB-1	$4,970	$2,420	$0	$0	$0	$0	$0	$0	$1,390	$8,780
STB-2	$6,880,000	$3,470	$2,130,000	$0	$0	$0	$0	$1,910	$1,860	$9,020,000
STB-3	$20,100	$4,580	$294,000	$0	$0	$0	$0	$0	$2,620	$321,000
STB-4	$0	$838	$0	$0	$0	$0	$0	$0	$449	$1,290
STB-5	$98,100	$1,240	$1,370,000	$0	$0	$3,100	$0	$3,820	$672	$1,480,000
STB-6	$2,480,000	$1,150	$3,440,000	$0	$0	$0	$0	$3,820	$627	$5,930,000
STB-7	$561,000	$18,600	$4,420,000	$0	$0	$0	$0	$1,910	$9,270	$5,010,000
STC-1	$12,500,000	$2,290	$4,930,000	$0	$0	$0	$0	$1,910	$68	$17,400,000
STC-2	$43,400,000	$6,820	$11,100,000	$0	$0	$0	$0	$1,910	$799	$54,500,000
VEN-1	$176,000	$1,360	$1,310,000	$0	$0	$0	$0	$1,910	$443	$1,480,000
VEN-2	$0	$2,460	$0	$0	$0	$0	$428	$0	$2,500	$5,390
VEN-3	$4,300,000	$2,340	$1,730,000	$0	$0	$0	$0	$3,820	$761	$6,030,000
YUB-1	$843,000	$0	$0	$0	$1,980	$0	$0	$0	$0	$845,000
Total	**$597,000,000**	**$172,000**	**$169,000,000**	**$267,000**	**$10,300**	**$25,400**	**$39,000**	**$57,300**	**$68,500**	**$767,000,000**

Note: Totals may not sum due to rounding.

EXHIBIT ES-6 DISTRIBUTION OF BASELINE DEVELOPMENT IMPACTS BY UNIT (PRESENT VALUE, 2008 DOLLARS, SEVEN PERCENT)

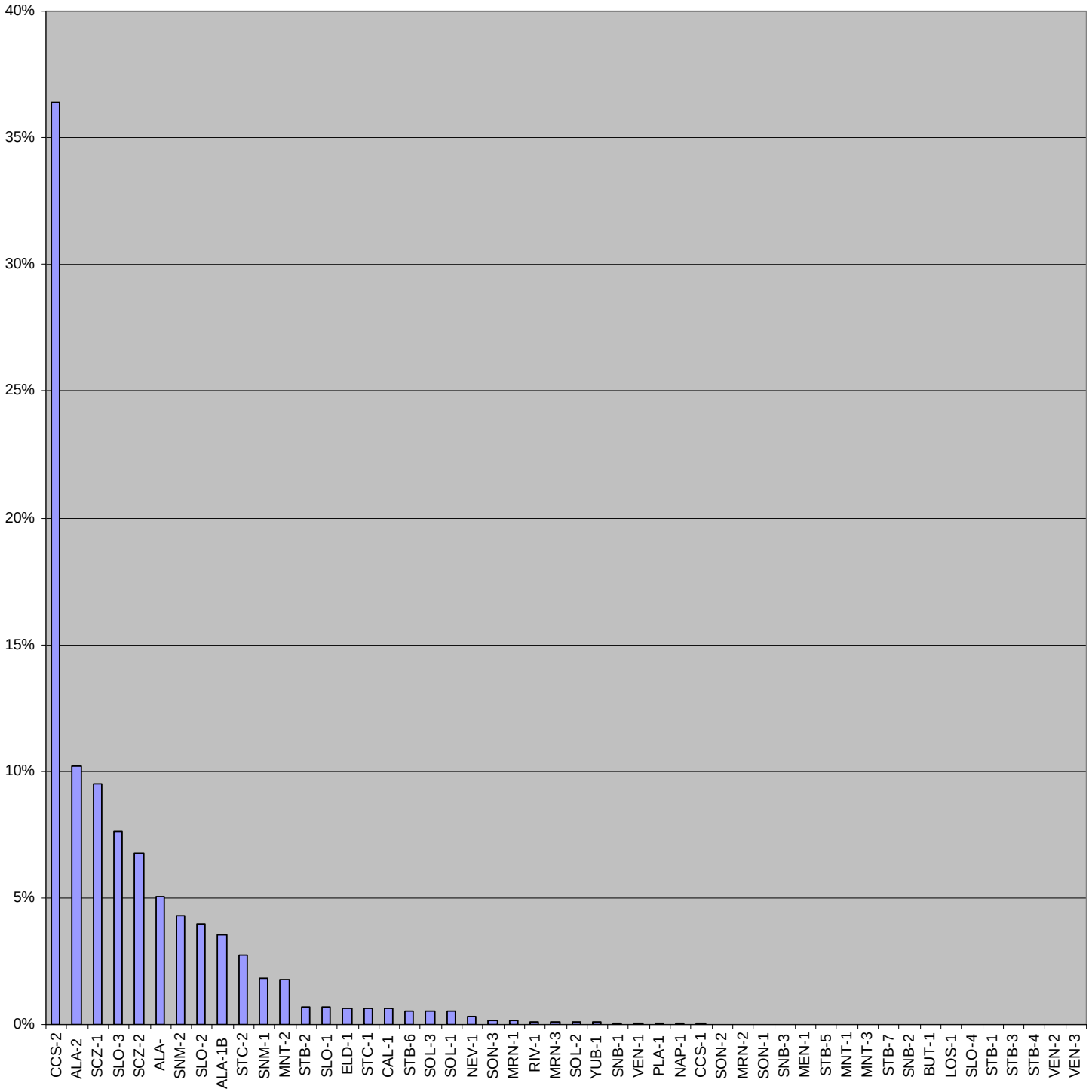

EXHIBIT ES-7 DISTRIBUTION OF INCREMENTAL DEVELOPMENT IMPACTS BY UNIT (PRESENT VALUE, 2008 DOLLARS, SEVEN PERCENT)

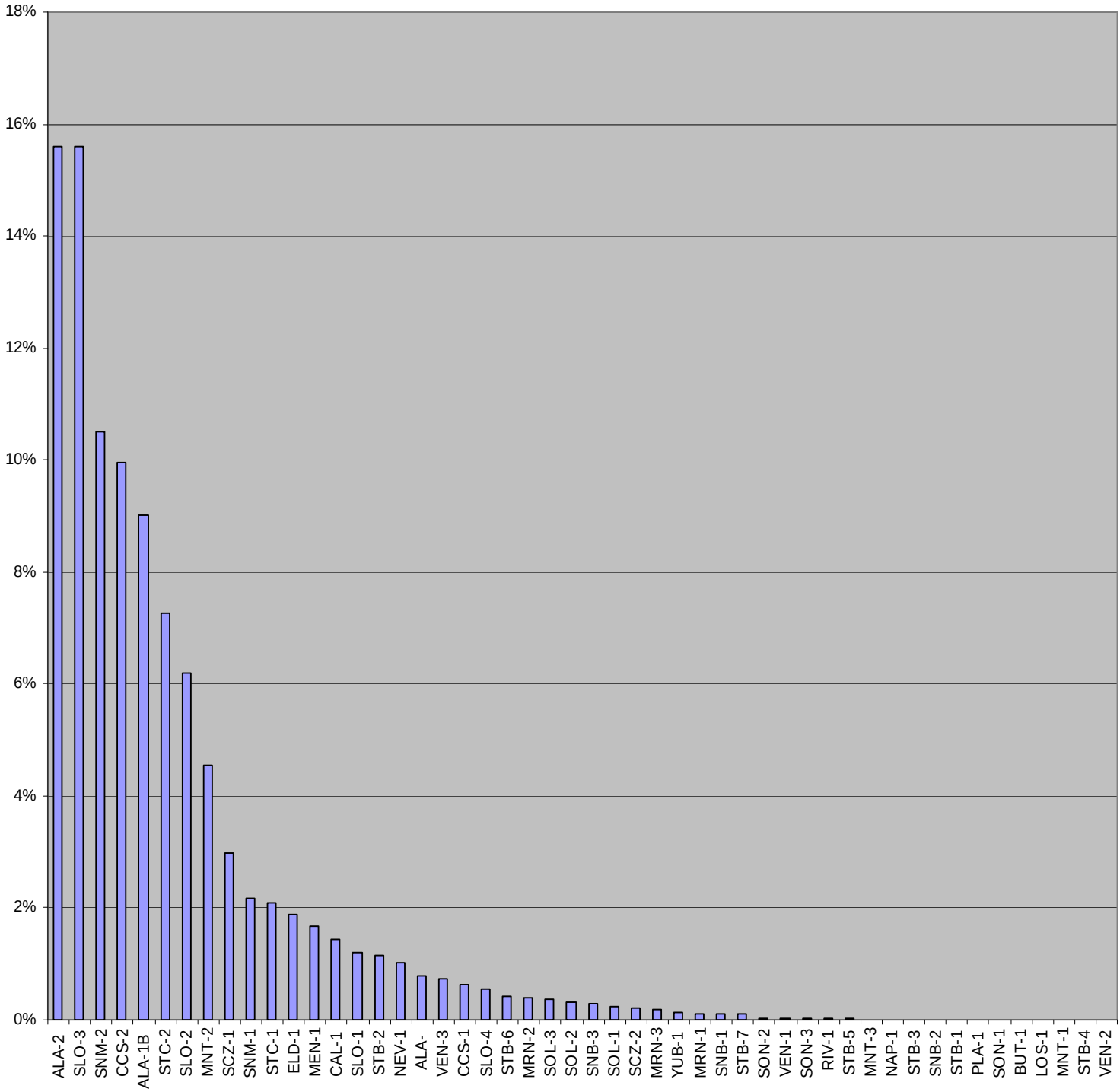

EXHIBIT ES-8 UNITS RANKED BY INCREMENTAL IMPACTS: HIGH-END SCENARIO (PRESENT VALUE, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

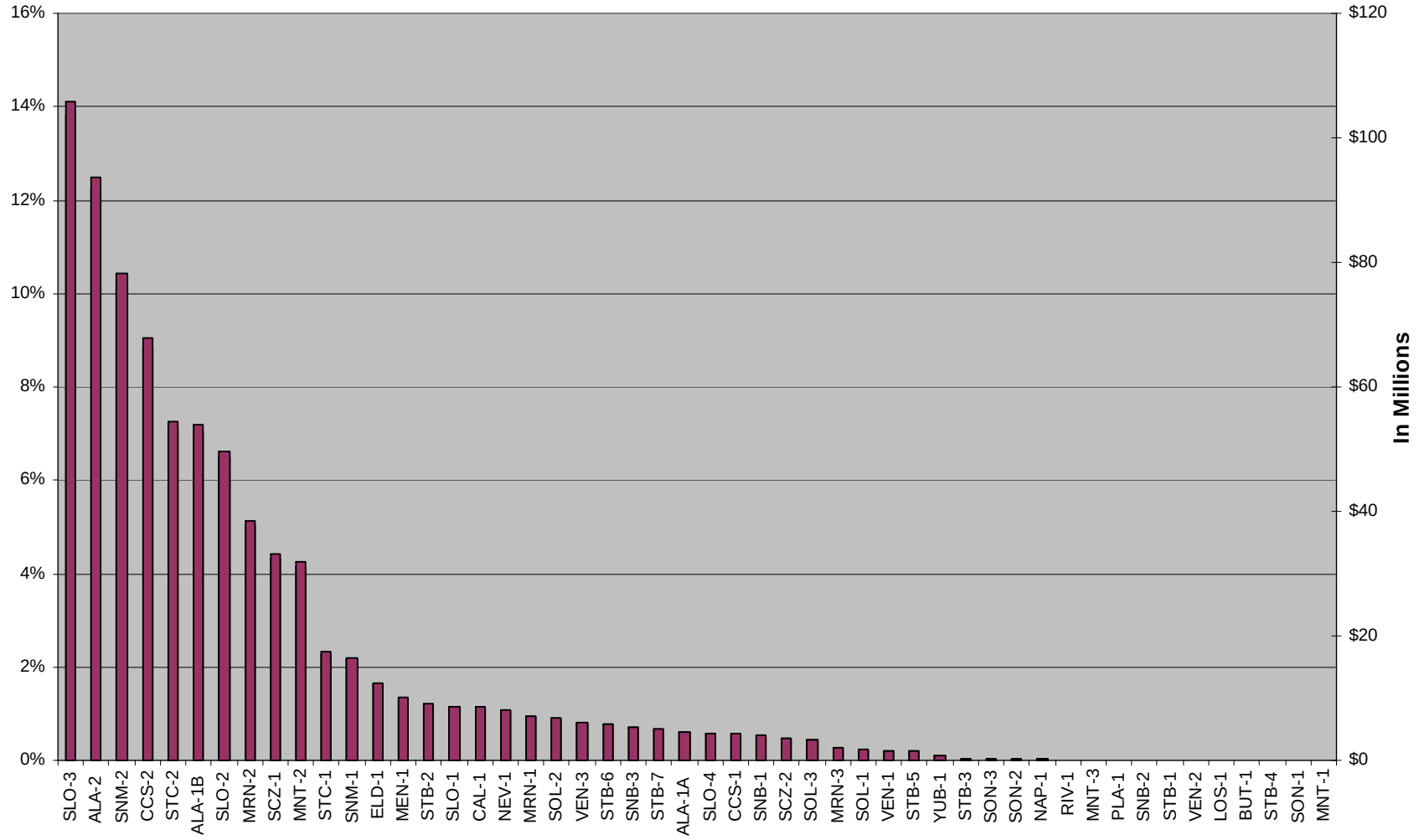

EXHIBIT ES-9 TOP TWENTY CENSUS TRACTS RANKED BY INCREMENTAL IMPACTS (PRESENT VALUE, 2008 DOLLARS, HIGH-END SCENARIO)

RANK	CENSUS TRACTS*	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
		PRESENT VALUE IMPACTS	PERCENTAGE OF IMPACTS	PRESENT VALUE IMPACTS	PERCENTAGE OF IMPACTS
1	ALA-2-6001451101	$125,000,000	11.3%	$86,500,000	11.3%
2	SNM-2-6081613800	$111,000,000	10.0%	$76,900,000	10.0%
3	STC-2-6085512700	$75,900,000	6.9%	$52,700,000	6.9%
4	ALA-1B-6001435101	$70,600,000	6.4%	$49,000,000	6.4%
5	MRN-2-6041133000	$55,400,000	5.0%	$38,500,000	5.0%
6	SLO-3-6079012702	$55,200,000	5.0%	$38,300,000	5.0%
7	SLO-2-6079010400	$53,900,000	4.9%	$37,400,000	4.9%
8	CCS-2-6013355104	$52,600,000	4.8%	$36,500,000	4.8%
9	SCZ-1-6087120200	$44,500,000	4.0%	$30,900,000	4.0%
10	SLO-3-6079011200	$34,700,000	3.1%	$24,100,000	3.1%
11	MNT-2-6053011600	$34,200,000	3.1%	$23,700,000	3.1%
12	SLO-3-6079010600	$25,900,000	2.3%	$18,000,000	2.3%
13	STC-1-6085512700	$20,400,000	1.8%	$14,200,000	1.9%
14	SLO-3-6079012704	$19,400,000	1.8%	$13,500,000	1.8%
15	CCS-2-6001451101	$18,800,000	1.7%	$13,000,000	1.7%
16	CCS-2-6013303200	$17,700,000	1.6%	$12,300,000	1.6%
17	SLO-2-6079010800	$17,300,000	1.6%	$12,000,000	1.6%
18	SNM-1-6081613700	$14,700,000	1.3%	$10,200,000	1.3%
19	MEN-1-6045011100	$14,500,000	1.3%	$10,000,000	1.3%
20	ELD-1-6017031405	$14,300,000	1.3%	$9,900,000	1.3%

* In order to estimate impacts by critical habitat unit, the impacts to all census tracts overlapping a given critical habitat unit are summed. Thus, a critical habitat unit that contains the census tract with the highest impacts may not be the same critical habitat unit with the highest overall impacts (i.e., the impacts to other census tracts within the same critical habitat unit may be small).

SUMMARY OF BASELINE IMPACTS

9. Baseline impacts associated with consideration of the frog and its habitat are estimated to be $2.38 billion to $2.50 billion (approximately $180 million to $188 million on an annualized basis), assuming a three percent discount rate, or $1.65 billion to $1.74 billion (approximately $152 million to $160 million on an annualized basis), assuming a seven percent discount rate. These costs are evidence of the significant regulatory protection that has been afforded this species by its listing under the Act as well as by the California Environmental Quality Act (CEQA). Census tract 06013355104 (within proposed Unit CCS-2) has the largest baseline impacts of the areas considered for designation, $188 million under the high-end scenario, assuming a discount rate of seven percent.

SUMMARY OF INCREMENTAL IMPACTS

10. Incremental impacts associated with consideration of the frog and its habitat are estimated to be $1.04 billion to $1.10 billion (approximately $93.7 million to $97.9 million on an annualized basis), assuming a three percent discount rate, or $721 million to $767 million (approximately $67.9 million to $72.0 million on an annualized basis), assuming a seven percent discount rate. Census tract 06001451101 (within proposed Unit ALA-2) has the largest incremental impacts of the areas considered for designation, $86.5 million under the high-end scenario, assuming a discount rate of seven percent.

DISCUSSION OF RESULTS

11. Under the high-end scenario (assuming a seven percent discount rate), impacts to urban development represent approximately 73 percent and 78 of the total post-designation baseline and incremental impacts, respectively. Agricultural activities account for an additional 27 percent and 22 percent of the total post-designation baseline and incremental impacts, respectively. Impacts to all other activities represent less than one percent of the total post-designation baseline and incremental impacts.

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

12. The main cost expected in the post-designation period results from delayed construction during the section 7 consultation process (on average nine months) and the CEQA review process (on average two years). The loss is based on the opportunity cost to developers of carrying undeveloped land during those time periods. The delay cost is calculated by multiplying the value of the land to be developed with the market interest rate and the time period (i.e., nine months). The market interest rate assumed in this analysis is 15 percent, which reflects a rate commonly used by developers to value a risky cash flow. The differences in project modification costs in the low and high impact scenarios are overcome by these delay costs, which are the same for both scenarios.

13. Uncertainty regarding the type of project modifications required to offset impacts to the frog from urban development results in the evaluation of two scenarios. Under the first scenario, the Service may require compensating for impacts to the frog and its habitat from development activities by purchasing land and protecting it for the benefit of the

frog. The average price per acre at local land conservation banks depends on the type of compensating habitat required -- $11,000 per acre of dispersal habitat to $140,000 per acre for breeding habitat. Under the second scenario, the Service may recommend habitat restoration to offset development impacts, estimated to cost on average $50,000 per acre.

14. Development impacts vary widely both across the study area as well as within proposed critical habitat units. The counties of Alameda, Contra Costa, Santa Cruz, San Luis Obispo and San Mateo experience the greatest impacts due primarily to the high number of acres projected for development in each county within the study area. Land values also play a significant factor. Land values in Alameda, Contra Costa, San Mateo, and San Luis Obispo counties are among the highest in the study area – estimated at greater than $2.5 million per developed acre in some areas.

AGRICULTURE

15. Costs for protection of the frog and its habitat for agriculture activities are based on the conservation measures established by a Stipulated Injunction issued by the U.S. District Court for the Northern District of California on October 20, 2006. Specifically, the stipulated injunction imposes no-use buffer zones around upland and aquatic habitat and disallows the use of 66 pesticide active ingredients within those habitats and buffer zones (60 feet to 200 feet for ground and aerial applications, respectively). This analysis assumes that implementation of no-pesticide use areas will effectively result in the loss of agricultural production in affected areas. As part of the stipulated injunction, the U.S. Environmental Protection Agency (EPA) is required to prepare effects determinations for each pesticide active ingredient and initiate consultation with the Service. To the extent that future consultation with the Service on each pesticide active ingredient find more flexible ways to avoid jeopardy or adverse modification (e.g., adjustments in cropping or pesticide use practices), agricultural impacts in the post-designation period may be overstated. Furthermore, the analysis of agricultural activities does not take into account the potential for the conversion of agricultural lands to non-agricultural uses such as residential or commercial development; future land use changes may affect the report's results.

KEY SOURCES OF UNCERTAINTY

16. In proposed critical habitat areas, the key factor determining whether incremental impacts are expected is the likelihood that project proponents will detect the frog during pre-activity assessments and surveys. This analysis relies on guidance issued by the Service in 1997 and revised in 2005 to assist project proponents in assessing the likelihood of frog presence on their property or in the vicinity of the proposed project area. One of the primary data sources used by project proponents is the California Natural Diversity Data Base (CNDDB) maintained by the California Department of Fish and Game Natural Heritage Division. The CNDDB is a repository of reported sightings of rare species and natural communities and is updated on a regular basis as new data becomes available. Discussions with stakeholders indicate that the CNDDB is a well-known resource used by

project proponents to assess frog presence within a project area. This analysis relies on the CNDDB to identify areas where a project proponent would likely detect the frog. Impacts in these areas are attributed to the baseline.

17. In areas without any reported frog sightings in the CNDDB, the Service typically requires focused field surveys as well as site-specific assessments of suitable habitat and habitat connectivity. Ideally, this analysis would rely on data about the frequency that these additional site assessment activities result in the detection of the frog. However, according to discussions with the Service, these data are not tracked. Accordingly, this analysis conservatively assumes that frogs will not likely be detected in these areas. To the extent that this approach under-estimates the likelihood that frogs will be detected in a proposed critical habitat unit, baseline impacts will be understated and incremental impacts will be overstated.

18. Impact estimates are driven by delay costs, which rely on point estimates of the typical length of delay likely to be experienced by developers. The delay associated with the section 7 consultation process is assumed to be nine months, and the delay associated with additional CEQA review is assumed to be two years. Furthermore, these delays are assumed to be sequential. If these assumptions represent worst-case, rather than average, delay times, impacts are likely overstated.

19. Finally, the application of different discount rates to estimate present value and annualized costs reveals another key source of uncertainty in the analysis, as impacts applying a seven percent discount rate are roughly 70 percent of the value of impacts calculated using a three percent discount rate. As discussed above, the cost of development delays drives the overall impact estimates. Delay costs are dependent on raw land values, which are estimated by combining information about the value of fully-developed acres and the timing of future development. Consideration of timing relies on the social discount rates applied throughout this analysis (three and seven percent), rather than developers' opportunity cost of capital, which is likely much higher. As a result, raw land values, and therefore delay costs, are likely overstated under both discount rate assumptions.

CHAPTER 1 | INTRODUCTION

1.1 INTRODUCTION

1. The purpose of this report is to estimate the economic impact of the proposed revision to designated critical habitat for the federally listed California red-legged frog (*Rana aurora draytonii*, "frog"). The report was prepared collaboratively by Industrial Economics, Incorporated (IEc) and Berkeley Economic Consulting (BEC) for the U.S. Fish and Wildlife Service (Service).

2. This analysis identifies the incremental effects of the proposed rule by estimating the impacts of actions taken to protect the frog and its habitat under two scenarios, one "without critical habitat" and the other "with critical habitat." The difference between the two represents the costs of the proposed rule. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation, unless such exclusion would result in the extinction of the species.[1] In addition, this information allows the Service to address the requirements of Executive Orders (E.O.) 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).[2] Detailed discussion of the framework for this analysis is provided in Chapter 2.

3. This section provides a brief introduction to the revised proposed critical habitat for the frog. It includes a summary of past publications and legal actions that relate to the current proposal, a summary of land ownership within the current proposal, a map of the proposed units, and a summary of threats to the proposed critical habitat. This information is intended to provide background information to the reader. All official definitions and boundaries should be taken from the Proposed Rule.[3]

[1] 16 U.S.C. §1533(b)(2).

[2] Executive Order 12866, Regulatory Planning and Review, September 30, 1993 (as amended by Executive Order 13258 (2002) and Executive Order 13422 (2007)); Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. § 601 et seq; and Pub Law No. 104-121.

[3] 2008 Proposed Rule, 73 FR 53492.

1.2 PREVIOUS FEDERAL ACTIONS

4. A Final Rule listing the frog as endangered under the Act was published on May 23, 1996.[4] Subsequently, the Service designated critical habitat for the frog across 4,140,440 acres in 28 California counties on March 13, 2001.[5] Then, on June 8, 2001, various homebuilding and commerce organizations filed a lawsuit against the Service challenging the final rule designating critical habitat for the frog.[6] In November 2002 a settlement was reached to re-evaluate the 2001 critical habitat designation and on April 13, 2006, the Service re-designated critical habitat for the frog across 450,288 acres in 20 California counties.[7]

5. More recently, on July 20, 2007, the Service announced that it would review the April 13, 2006, final rule after questions were raised about the integrity of scientific information used and whether the decision made was consistent with the appropriate legal standards. Based on these criteria, the Service determined it was necessary to revise critical habitat for the frog. On December 12, 2007, the Center for Biological Diversity filed a complaint in the U.S. District Court for the Northern District of California challenging the Service's designation of critical habitat for the frog.[8] On September 16, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the frog.[9] This economic analysis addresses the September 16, 2008 proposed rule.

1.3 PROPOSED CRITICAL HABITAT DESIGNATION

6. The 2006 critical habitat rule for the frog consisted of 34 units comprising a total of 450,288 acres. The proposed revision includes 50 units comprising a total of 1,804,865 acres. In this revised proposal, the Service began its analysis to identify essential habitat without using the previous final designation as a base due to the potential inappropriate influence on the extent and location of that rule by U.S. Department of the Interior (DOI) personnel. According to the proposed rule, this unrestricted analysis resulted in an increase in the amount and distribution of proposed critical habitat.[10] Exhibit ES-1 depicts the proposed critical habitat units.

7. Exhibit 1-1 provides information concerning land ownership for the proposed revised habitat by unit. The majority of proposed critical habitat (approximately 65 percent) is privately owned. Approximately 21 percent of proposed critical habitat is Federal land with National Forests representing the majority (78 percent) of those lands (i.e., portions of: Plumas, Eldorado, Tahoe, Los Padres, and Angeles National Forests). State lands

[4] 1996 Final Listing Rule, 61 FR 25813.

[5] 2001 Final Rule, 66 FR 14626.

[6] Home Builders Ass'n of Northern California, et al. v. Norton, et al., Civ. No. 01–1291 (RJL) (D. D.C.).

[7] 2006 Final Rule, 71 FR 19244.

[8] Center for Biological Diversity v. Kempthorne, et al., Case No. C–07–6404–WHA.

[9] 2008 Proposed Rule, 73 FR 53492.

[10] 2008 Proposed Rule, 73 FR 53492.

EXHIBIT 1-1 DISTRIBUTION OF PROPOSED REVISED CRITICAL HABITAT BY LAND OWNERSHIP CATEGORY

SUBUNIT	SUBUNIT NAME	ACRES BY OWNER TYPE (PERCENT OF PCH UNIT)					GRAND TOTAL
		FEDERAL	STATE	LOCAL	PRIVATE	NGO/OTHER	
ALA-1A	Dublin Canyon	0 (0%)	0 (0%)	267 (7.32%)	3,383 (92.68%)	0 (0%)	3,650
ALA-1B	Cook Canyon	0 (0%)	0 (0%)	736 (7.24%)	9,432 (92.76%)	0 (0%)	10,168
ALA-2	Arroyo Valle	6,892 (4.49%)	97 (0.06%)	2,329 (1.52%)	144,306 (93.93%)	0 (0%)	153,624
BUT-1	Hughes Place Pond	3,222 (60.87%)	250 (4.73%)	0 (0%)	1,821 (34.41%)	0 (0%)	5,294
CAL-1	Young's Creek	7 (0.17%)	0 (0%)	0 (0%)	4,442 (99.83%)	0 (0%)	4,450
CCS-1	Berkeley Hills	0 (0%)	0 (0%)	4,205 (30.34%)	9,645 (69.6%)	8 (0.06%)	13,858
CCS-2	Mount Diablo	0 (0%)	9,869 (7.11%)	7,623 (5.49%)	121,215 (87.29%)	151 (0.11%)	138,858
ELD-1	Spivey Pond	750 (13.57%)	0 (0%)	0 (0%)	4,775 (86.43%)	0 (0%)	5,525
LOS-1	San Francisquito Creek	3,906 (92.31%)	0 (0%)	0 (0%)	325 (7.69%)	0 (0%)	4,231
MEN-1	Greenwood Creek	86 (0.32%)	296 (1.1%)	0 (0%)	26,400 (98.24%)	92 (0.34%)	26,875
MNT-1	Elkhorn Slough	0 (0%)	0 (0%)	0 (0%)	519 (100%)	0 (0%)	519
MNT-2	Carmel River	26,104 (21.85%)	827 (0.69%)	1,373 (1.15%)	91,187 (76.31%)	0 (0%)	119,491
MNT-3	Big Sur Coast	9,936 (36.08%)	6,025 (21.88%)	0 (0%)	11,581 (42.05%)	0 (0%)	27,542
MRN-1	Estero	0 (0%)	0 (0%)	0 (0%)	7,840 (100%)	0 (0%)	7,840
MRN-2	Salmon Creek	0 (0%)	0 (0%)	0 (0%)	22,559 (100%)	0 (0%)	22,559
MRN-3	Point Reyes Peninsula	31,665 (93.33%)	164 (0.48%)	0 (0%)	2,098 (6.18%)	0 (0%)	33,927
NAP-1	Wragg Creek	0 (0%)	0 (0%)	0 (0%)	2,524 (100%)	0 (0%)	2,524
NEV-1	Sailor Flat	3,165 (38.2%)	15 (0.18%)	0 (0%)	5,106 (61.62%)	0 (0%)	8,285
PLA-1	Michigan Bluff	820 (65.93%)	0 (0%)	0 (0%)	424 (34.07%)	0 (0%)	1,243
RIV-1	Cole Creek	0 (0%)	0 (0%)	0 (0%)	1,953 (47.66%)	2,144 (52.34%)	4,097
SCZ-1	North Coastal Santa Cruz County	226 (0.31%)	20,532 (28.42%)	0 (0%)	51,497 (71.27%)	0 (0%)	72,255
SCZ-2	Watsonville Slough	115 (2.83%)	0 (0%)	0 (0%)	3,942 (97.17%)	0 (0%)	4,057
SLO-1	Cholame	169 (0.94%)	0 (0%)	0 (0%)	17,849 (99.06%)	0 (0%)	18,018
SLO-2	Piedras Blancas to Cayucos Creek	497 (0.42%)	691 (0.59%)	0 (0%)	116,260 (98.99%)	0 (0%)	117,449
SLO-3	Willow and Toro Creeks to San Luis Obispo	29,107 (23.78%)	12,689 (10.36%)	0 (0%)	80,624 (65.86%)	0 (0%)	122,420
SLO-4	Upper Salinas River	23,970 (69.55%)	0 (0%)	0 (0%)	10,493 (30.45%)	0 (0%)	34,463
SNB-1	Hollister Hills/San Benito River	13 (0.04%)	3,109 (8.57%)	0 (0%)	33,172 (91.4%)	0 (0%)	36,293
SNB-2	Antelope Creek/Upper Tres Pinos Creek	0 (0%)	0 (0%)	0 (0%)	17,356 (100%)	0 (0%)	17,356

SUBUNIT	SUBUNIT NAME	ACRES BY OWNER TYPE (PERCENT OF PCH UNIT)					GRAND TOTAL
		FEDERAL	STATE	LOCAL	PRIVATE	NGO/OTHER	
SNB-3	Pinnacles National Monument	20,221 (31.72%)	0 (0%)	0 (0%)	43,532 (68.28%)	0 (0%)	63,753
SNM-1	Cahill Ridge	887 (2.54%)	17,102 (48.93%)	206 (0.59%)	16,186 (46.31%)	570 (1.63%)	34,952
SNM-2	Pescadero	406 (0.42%)	3,977 (4.14%)	6,332 (6.59%)	85,420 (88.85%)	4 (0%)	96,138
SOL-1	Sky Valley	0 (0%)	0 (0%)	0 (0%)	11,971 (100%)	0 (0%)	11,971
SOL-2	Jameson Canyon	0 (0%)	0 (0%)	0 (0%)	3,360 (100%)	0 (0%)	3,360
SOL-3	American Canyon	0 (0%)	0 (0%)	0 (0%)	3,510 (76.36%)	1,087 (23.64%)	4,597
SON-1	Annandel	0 (0%)	1,157 (73.96%)	0 (0%)	407 (26.04%)	0 (0%)	1,564
SON-2	Sonoma Mountain	0 (0%)	0 (0%)	0 (0%)	4,932 (100%)	0 (0%)	4,932
SON-3	Petaluma	0 (0%)	0 (0%)	105 (4.7%)	2,125 (95.3%)	0 (0%)	2,230
STB-1	La Brea Creek	20,895 (83.04%)	0 (0%)	0 (0%)	4,269 (16.96%)	0 (0%)	25,164
STB-2	San Antonio Terrace	23,911 (66.41%)	0 (0%)	0 (0%)	12,092 (33.59%)	0 (0%)	36,003
STB-3	Sisquoc River	40,115 (84.35%)	0 (0%)	0 (0%)	7,444 (15.65%)	0 (0%)	47,559
STB-4	Jalama Creek	1,012 (11.64%)	0 (0%)	0 (0%)	7,681 (88.36%)	0 (0%)	8,693
STB-5	Gaviota Creek	1,547 (12%)	2,074 (16.09%)	0 (0%)	9,267 (71.9%)	0 (0%)	12,888
STB-6	Arroyo Quemado to Refugio Creek	1,881 (15.69%)	28 (0.23%)	0 (0%)	10,076 (84.08%)	0 (0%)	11,985
STB-7	Upper Santa Ynez River and Matilija Creek	124,904 (86.07%)	0 (0%)	0 (0%)	20,216 (13.93%)	0 (0%)	145,120
STC-1	Canada de Pala	37 (0.07%)	0 (0%)	8,450 (16.16%)	43,795 (83.77%)	0 (0%)	52,283
STC-2	Wilson Peak	352 (0.17%)	53,266 (26.02%)	74 (0.04%)	151,025 (73.77%)	0 (0%)	204,717
VEN-1	San Antonio Creek	0 (0%)	0 (0%)	0 (0%)	2,915 (100%)	0 (0%)	2,915
VEN-2	Piru Creek	8,363 (94.64%)	0 (0%)	0 (0%)	474 (5.36%)	0 (0%)	8,837
VEN-3	Upper Las Virgenes Canyon	56 (1.12%)	0 (0%)	0 (0%)	4,833 (96.66%)	111 (2.22%)	5,000
YUB-1	Little Oregon Creek	2,486 (39.33%)	0 (0%)	0 (0%)	3,836 (60.67%)	0 (0%)	6,322
Total		**387,724 (21.45%)**	**132,168 (7.31%)**	**31,701 (1.75%)**	**1,252,096 (69.26%)**	**4,167 (0.23%)**	**1,807,857**
AREAS CONSIDERED FOR EXCLUSION							
ALA-1A	Dublin Canyon	0 (0%)	0 (0%)	267 (100%)	0 (0%)	0 (0%)	267
ALA-1B	Cook Canyon	0 (0%)	0 (0%)	286 (100%)	0 (0%)	0 (0%)	286
CCS-1	Berkeley Hills	0 (0%)	0 (0%)	4,202 (100%)	0 (0%)	0 (0%)	4,202
CCS-2	Mount Diablo	0 (0%)	5,857 (6.47%)	7,599 (8.39%)	76,943 (84.97%)	151 (0.17%)	90,551
ELD-1	Spivey Pond	54 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	54
RIV-1	Cole Creek	0 (0%)	0 (0%)	0 (0%)	1,953 (47.66%)	2,144 (52.34%)	4,097
SCZ-1	North Coastal Santa Cruz County	0 (0%)	0 (0%)	0 (0%)	6 (100%)	0 (0%)	6

SUBUNIT	SUBUNIT NAME	ACRES BY OWNER TYPE (PERCENT OF PCH UNIT)					GRAND TOTAL
		FEDERAL	STATE	LOCAL	PRIVATE	NGO/OTHER	
Subtotal		**55 (0.05%)**	**5,857 (5.89%)**	**12,354 (12.42%)**	**78,902 (79.33%)**	**2,296 (2.31%)**	**99,464**

Note: Totals may not sum due to rounding.
Sources:
(1) U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the California Red-Legged Frog (Rana aurora draytonii); Proposed Rule, published in the Federal Register on September 16, 2008, Vol. 73, No. 180.
(2) California Resources Agency. 2007. Public, Conservation and Trust Lands, v05_2. Data developed by VESTAS Resources, Inc. under contract to the California Resources Agency Legacy Project. January 2007. Sacramento, California.

represent approximately 10 percent of proposed critical habitat, with California Department of Parks and Recreation (CA DPR) land making up the majority (87 percent). Finally, local ownership (e.g., counties, cities, and water districts) represents approximately four percent of proposed critical habitat. All other proposed critical habitat (less than one percent) is owned by conservation groups (e.g., The Nature Conservancy) and non- governmental agencies (NGOs). All of the proposed units are considered to be currently occupied by the frog.[11]

8. Of the total acres proposed, the Service is considering excluding a total of 105,013 acres, including:

- Six acres of private land in Santa Cruz County protected by the Bonny Doon Quarries Settlement Ponds Habitat Conservation Plan (HCP);
- 54 acres of Federal lands managed by the U.S. Bureau of Land Management (BLM) constituting the Spivey Pond Management Area and subject to the Spivey Pond Management;
- 92,592 acres of local land protected by the East Contra Costa County HCP;
- 8,292 acres of local land managed by the East Bay Regional Park District (EBRPD); and
- 4,097 acres of State, local and private land protected by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

1.4 THREATS TO CRITICAL HABITAT AREAS

9. This report describes and quantifies the potential economic impacts associated with proposed critical habitat designation for the frog in relation to the threats identified by the Service. The proposed rule describes threats to proposed critical habitat, including:

- Residential and Commercial Development;
- Water Management;
- Agriculture;
- Ranching/Grazing;
- Timber Harvest;
- Transportation;
- Fire Management;
- Utility and Pipeline Construction; and
- Habitat Management.[12]

[11] 2008 Proposed Rule, 73 FR 53492.

[12] 2008 Proposed Rule, 73 FR 53492

10. Exhibit 1-2 provides a summary of the activities that could potentially harm proposed critical habitat. It identifies the potentially affected proposed units and specific threats that may be caused by each activity. The final column lists examples of several frog conservation measures to avoid, mitigate, or compensate for these threats. These measures were reported in the proposed rule, the section 7 consultation history, the recovery plan, and in communication with staff at the Service's Sacramento Fish and Wildlife Office. These conservation measures are the basis of the economic impacts discussed in this analysis.

1.5 STRUCTURE OF THE REPORT

11. This report describes and quantifies the potential economic impacts associated with proposed critical habitat designation for the frog in relation to the threats identified by the Service. The proposed rule describes threats to proposed critical habitat, including:

- Chapter 2: Framework for the Analysis;
- Chapter 3: Baseline Regulations;
- Chapter 4: Residential and Commercial Development;
- Chapter 5: Water Management;
- Chapter 6: Agriculture;
- Chapter 7: Grazing;
- Chapter 8: Timber Harvest;
- Chapter 9: Transportation;
- Chapter 10: Utility and Pipeline Construction;
- Chapter 11: Fire Management;
- Chapter 12: Habitat & Vegetation Management;
- Chapter 13: Economic Benefits
- References;
- Appendix A: Small Business and Energy Impact Analysis;
- Appendix B: Census Tract Exhibits;
- Appendix C: Three Percent Discount Rate Exhibits;
- Appendix D: Undiscounted Stream of Impacts; and
- Appendix E: Technical Information for Impacts to Urban Development.

EXHIBIT 1-2 ACTIVITIES, THREATS AND POTENTIAL FROG CONSERVATION MEASURES

ECONOMIC ACTIVITY	AFFECTED UNITS	THREATS	EXAMPLES OF SPECIAL MANAGEMENT TO AVOID, MITIGATE OR COMPENSATE FOR THREAT
Urban Development	**All**	▪ Loss and fragmentation of habitat and landscape connectivity ▪ Habitat destruction and degradation ▪ Mechanical soil disturbance, clearing or grading	▪ Habitat restoration/mitigation to compensate for lost habitat following project completion ▪ Purchase conservation habitat to offset development
Agriculture	**37 Units**: ALA-2, CCS-1, CCS-2, ELD-1, MNT-2, MNT-3, MRN-1, MRN-2, MRN-3, NAP-1, NEV-1, RIV-1, SCZ-1, SCZ-2, SLO-1, SLO-2, SLO-3, SLO-4, SNB-1, SNB-2, SNB-3, SNM-1, SNM-2, SOL-1, SOL-2, SON-1, SON-2, SON-3, STB-2, STB-3, STB-5, STB-6, STB-7, STC-1, STC-2, VEN-1, VEN-3	▪ Direct toxic effects to frog or its prey base ▪ Contamination of water with fertilizers and pesticides	▪ Avoid pesticide use in frog habitat and in buffer zones around frog habitat
Ranching/ Grazing	**12 Units**: CAL-1, MEN-1, MRN-1, MRN-3, SOL-1, SOL-3, CCS-1, CCS-2, STC-1, SLO-1, SLO-2, SLO-3	▪ Higher instream water temperatures resulting from reduction or removal of vegetation ▪ Channel downcutting ▪ Lowered water tables ▪ Loss of plunge pools, which results in direct loss of pool habitats for the frog ▪ Diminished water quality through increased sediment loads and nutrient levels	▪ Species survey and monitoring ▪ Implementation of best management practices in Riparian Conservation Areas as described in the Sierra Nevada Forest Plan Amendment Standards and Guidelines for Aquatic and Riparian Ecosystems
Timber Harvest	**5 Units**: BUT-1, ELD-1, NEV-1, PLA-1, YUB-1	▪ Degradation of instream and riparian habitat through increased sedimentation ▪ Removal of trees that provide instream and streamside habitat structure and shade ▪ Changed patterns of runoff	▪ Implementation of best management practices to preserve water quality and protect forested areas immediately adjacent to waterbodies during timber harvest activities.

ECONOMIC ACTIVITY	AFFECTED UNITS	THREATS	EXAMPLES OF SPECIAL MANAGEMENT TO AVOID, MITIGATE OR COMPENSATE FOR THREAT
Water Management, Transportation, Utility and Oil & Gas Pipeline,	**All**	▪ Loss and fragmentation of habitat and landscape connectivity ▪ Habitat destruction and degradation	▪ Pre-construction survey, capture and removal of any frogs by qualified biologists ▪ Construction confined to the dry season ▪ Implementation of best management practices to protect riparian areas during construction activities ▪ In areas temporarily disturbed, vegetation will be removed by hand, where feasible, instead of by heavy equipment
Fire Suppression	**5 Units**: BUT-1, ELD-1, NEV-1, PLA-1, YUB-1	▪ Dewater aquatic frog habitat, thereby resulting in the desiccation of egg masses or direct death of adults from water drafting	▪ Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles ▪ Avoid establishing staging bases, heli-bases, base camps, firelines or other areas of human concentration and equipment use within frog suitable and occupied habitat and riparian areas to the maximum extent possible ▪ Maintain and enhance soil productivity in riparian and upland areas by retention of standing and down coarse woody debris ▪ Avoid or minimize soil erosion by retention of ground cover in riparian and upland areas
Habitat Management	**All**	▪ Loss and fragmentation of habitat and landscape connectivity ▪ Habitat destruction and degradation	▪ Pre-construction frog surveys and removal of identified frogs ▪ Biologist on-site during all activities ▪ Worker education and training session ▪ Revegetate and re-contour all disturbed areas with native vegetation ▪ Construction work limited to the dry season (May 1 – Oct 31) and/or low stream flow periods (June 1 – Nov 1) ▪ Implementation of best management practices to protect riparian areas during construction activities

CHAPTER 2 | FRAMEWORK

12. The purpose of this report is to estimate the economic impact of actions taken to protect the federally-listed frog and its habitat. This analysis examines the impacts of restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas considered for critical habitat designation. This analysis employs "without critical habitat" and "with critical habitat" scenarios. The "without critical habitat" scenario represents the baseline for the analysis, considering protections already accorded the frog; for example, under the Federal listing and other Federal, State, and local regulations. The "with critical habitat" scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the frog. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur after the proposed critical habitat is finalized.

13. This information is intended to assist the Secretary of DOI in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas in the designation.[13] In addition, this information allows the Service to address the requirements of E.O. 12866 and 13211, and the RFA, as amended by SBREFA.[14]

14. This section describes the framework for the analysis. First, it describes the case law that led to the selection of the framework applied in this report. It then describes in economic terms the general categories of economic effects that are the focus of regulatory impact analysis, including a discussion of both efficiency and distributional effects. Next, this section defines the analytic framework used to measure these impacts in the context of critical habitat regulation, including the link between existing and critical habitat-related protection efforts and potential impacts, and the consideration of benefits. It concludes with a presentation of the information sources relied upon in the analysis and the structure of the report.

[13] 16 U.S.C. §1533(b)(2).

[14] E.O. 12866, Regulatory Planning and Review, September 30, 1993 (as amended by E.O. 13258 (2002) and E.O. 13422 (2007)); E.O. 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001; 5. U.S.C. §§601 *et seq*; and Pub Law No. 104-121.

2.1 BACKGROUND

15. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."[15] In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

16. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat, regardless of whether those impacts are attributable co-extensively to other causes.[16] Specifically, the court stated,

> "The statutory language is plain in requiring some kind of consideration of economic impact in the CHD [critical habitat designation] phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation…. Because economic analysis done using the FWS's [Fish and Wildlife Service's] baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA [Endangered Species Act]."[17]

17. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.[18] For example, in the March 2006 ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

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[15] OMB, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[16] *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

[17] *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

[18] *Cape Hatteras Access Preservation Alliance v. Department of Interior,* 344 F. Supp. 2d 108 (D.D.C.); *Center for Biological Diversity v. United States Bureau of Land Management*, 422 F. Supp/. 2d 1115 (N.D. Cal. 2006).

> "The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior,* 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. 'To find the true cost of a designation, the world with the designation must be compared to the world without it.'"[19]

18. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both:

    a. The baseline impacts of frog conservation from protections afforded the species absent critical habitat designation; and

    b. The estimated incremental impacts precipitated specifically by the designation of critical habitat for the species.

    Summed, these two types of impacts comprise the fully co-extensive impacts of frog conservation in areas considered for critical habitat designation.

19. Incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on "Application of the 'Destruction or Adverse Modification' Standard Under Section 7(a)(2) of the Endangered Species Act" and information from the Service regarding what potential consultations and project modifications may be imposed as a result of critical habitat designation over and above those associated with the listing.[20] Specifically, in *Gifford Pinchot Task Force v. United States Fish and Wildlife Service,* the Ninth Circuit invalidated the Service's regulation defining destruction or adverse modification of critical habitat, and the Service no longer relies on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat.[21] Under the statutory provisions of the Act, the Service determines destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional to serve its intended conservation role for the species. A detailed description of the methodology used to define baseline and incremental impacts is provided later in this section.

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[19] *Center for Biological Diversity et al, Plaintiffs, v. United States Bureau of Land Management et. al, Defendants and American Sand Association, et al, Defendant Intervenors*, Order re: Cross Motions for Summary Judgment, Case 3:03-cv-02509 Document 174 Filed 03/14/2006, pages 44-45.

[20] Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

[21] *Gifford Pinchot Task Force v. United States Fish and Wildlife Service*, No. 03-35279 (9th Circuit 2004).

2.2 CATEGORIES OF POTENTIAL ECONOMIC EFFECTS OF SPECIES CONSERVATION

20. This economic analysis considers both the economic efficiency and distributional effects that may result from efforts to protect the frog and its habitat (hereinafter referred to collectively as "frog conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if the set of activities that may take place on a parcel of land is limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of frog conservation efforts.

21. This analysis also addresses the distribution of impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation efforts on small entities and the energy industry. This information may be used by decision-makers to assess whether the effects of species conservation efforts unduly burden a particular group or economic sector. For example, while conservation efforts may have a small impact relative to the national economy, individuals employed in a particular sector of the regional economy may experience relatively greater impacts. The differences between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

2.2.1 EFFICIENCY EFFECTS

22. At the guidance of OMB and in compliance with E.O. 12866 "Regulatory Planning and Review," Federal agencies measure changes in economic efficiency in order to understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect frog habitat, these efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.[22]

23. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Army Corps of Engineers (USACE), may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When compliance activity is not expected to significantly affect markets -- that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or

[22] For additional information on the definition of "surplus" and an explanation of consumer and producer surplus in the context of regulatory analysis, see: Gramlich, Edward M., A Guide to Benefit-Cost Analysis (2nd Ed.), Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, EPA 240-R-00-003, September 2000, available at http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html.

service demanded given a change in price -- the measurement of compliance costs can provide a reasonable estimate of the change in economic efficiency.

24. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, protection measures that reduce or preclude the development of large areas of land may shift the price and quantity of housing supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

25. This analysis begins by measuring impacts associated with efforts undertaken to protect frog and its habitat. As noted above, in some cases, compliance costs can provide a reasonable estimate of changes in economic efficiency. In frog habitat, residential development projects experience the greatest impacts. However, the quantity and price of housing is not anticipated to be significantly affected. Instead, developers may experience compliance and delay costs. As a result, measurable changes in consumer and producer surplus are not anticipated.

2.2.2 DISTRIBUTIONAL AND REGIONAL ECONOMIC EFFECTS

26. Measurements of changes in economic efficiency focus on the net impact of conservation efforts, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may miss important distributional considerations. OMB encourages Federal agencies to consider distributional effects separately from efficiency effects.[23] This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

27. This analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, might be affected by future species conservation efforts.[24] In addition, in response to E.O. 13211 "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of conservation efforts on the energy industry and its customers.[25]

[23] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[24] 5 U.S.C. §§601 *et seq*.

[25] E.O. 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use, May 18, 2001.

Regional Economic Effects

28. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation efforts. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using regional input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreators) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreators). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.

29. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts can overstate the long-term impacts of a regulatory change. Most importantly, these models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by affected businesses. In addition, the flow of goods and services across the regional boundaries defined in the model may change as a result of the regulation, compensating for a potential decrease in economic activity within the region.

30. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact.

31. Impacts associated with frog conservation activities largely include compliance and delay costs; the quantity of housing supplied in the broader region is not anticipated to be affected. Other types of projects are anticipated to go forward while incurring costs associated with surveying, monitoring, and habitat management. Therefore, measurable impacts of the type typically assessed with input-output models are not anticipated.

2.3 ANALYTIC FRAMEWORK AND SCOPE OF THE ANALYSIS

32. This analysis identifies those economic activities most likely to threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid or minimize such threats within the boundaries of the study area (the geographic boundaries of the study area are described later in this chapter). This section provides a description of the methodology used to separately identify baseline impacts and incremental impacts stemming from the proposed designation of critical habitat for the frog. This evaluation of impacts in a "with critical habitat designation" versus a "without critical habitat

designation" framework effectively measures the net change in economic activity associated with the proposed rulemaking.

2.3.1 IDENTIFYING BASELINE IMPACTS

33. The baseline for this analysis is the existing state of regulation, prior to the designation of critical habitat, that provides protection to the species under the Act, as well as under other Federal, State and local laws and guidelines. This "without critical habitat designation" scenario also considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

34. Baseline impacts include sections 7, 9, and 10 of the Endangered Species Act (Act), and economic impacts resulting from these protections to the extent that they are expected to occur absent the designation of critical habitat for the species.

- Section 7 of the Act, absent critical habitat designation, requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The portion of the administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from consideration of this standard, are considered baseline impacts. Baseline administrative costs of section 7 consultation are summarized later in Exhibit 2-2.
- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the "take" of endangered wildlife, where "take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."[26] The economic impacts associated with this section manifest themselves in sections 7 and 10.
- Under section 10(a)(1)(B) of the Act, an entity (e.g., a landowner or local government) may develop an HCP for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.[27] The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately avoided or minimized. The development and implementation of HCPs is considered a baseline protection for the species and habitat unless the HCP is determined to be precipitated by the designation of critical habitat, or the designation influences stipulated conservation efforts under HCPs.

[26] 16 U.S.C. 1532.

[27] U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at http://endangered.fws.gov/hcp/.

Enforcement actions taken in response to violations of the Act are not included in this analysis.

35. In the case of the frog, critical habitat was previously designated in 2001 and 2006.[28] The impacts of historical efforts to conserve critical habitat are assigned to the baseline, as these costs have already been incurred and therefore are unaffected by the proposed rule. In the future, the analysis assumes that the existing critical habitat is no longer in place as it has been revised by the new designation. To the extent that the study area for this analysis overlaps with the formerly designated habitat, future impacts attributable solely to critical habitat designation are attributed to the proposed rule currently under consideration.

36. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction. If compliance with the Clean Water Act or State environmental quality laws, for example, protects habitat for the species, such protective efforts are considered to be baseline protections and costs associated with these efforts are categorized accordingly. Of note, however, is that such efforts may not be considered baseline in the case that they would not have been triggered absent the designation of critical habitat. In these cases, they are considered incremental impacts and are discussed below.

2.3.2 IDENTIFYING INCREMENTAL IMPACTS

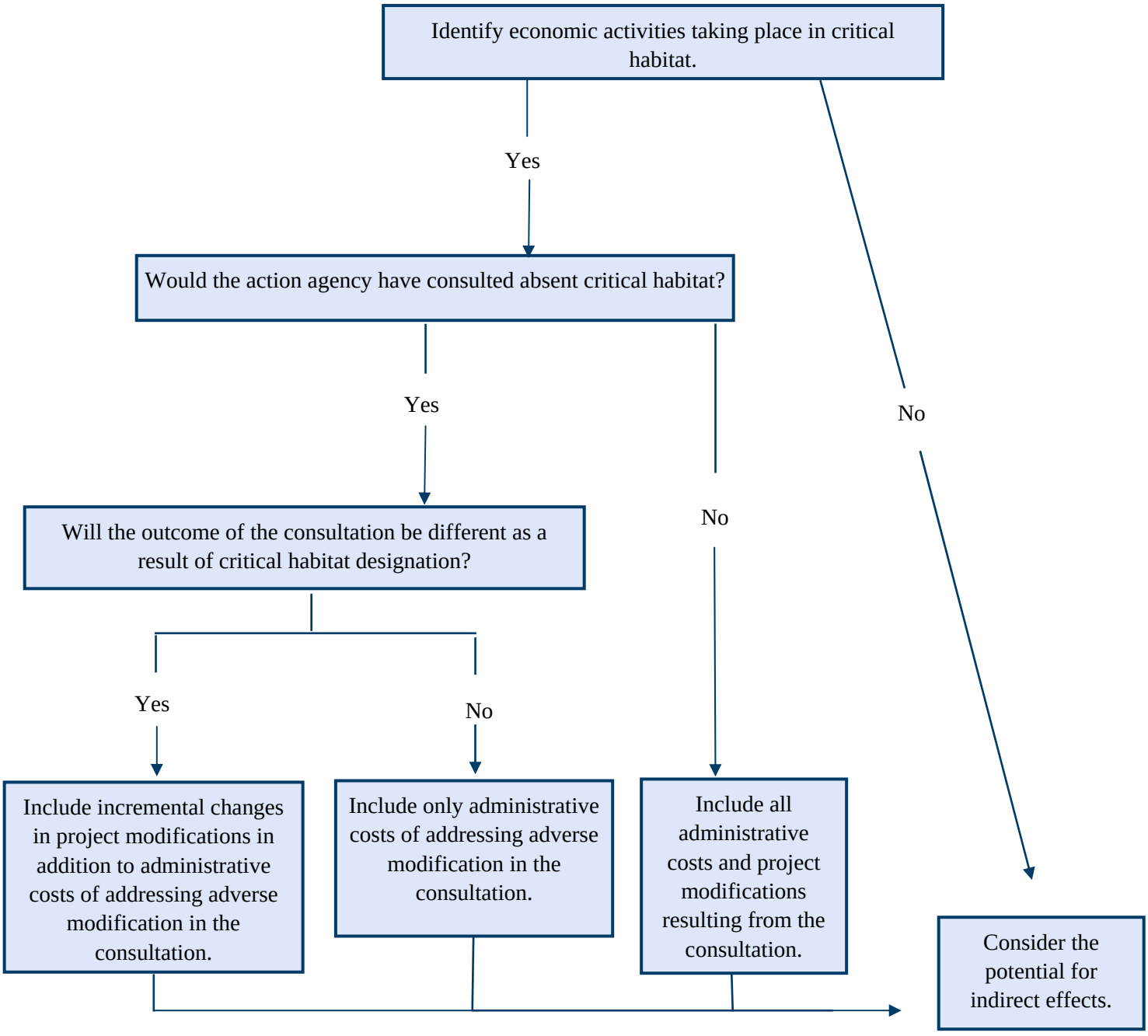
37. This analysis separately quantifies the incremental impacts of this rulemaking. The focus of the incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.

38. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing project modifications resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline and are considered incremental impacts of the rulemaking.

39. Exhibit 2-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.

[28] 66 FR 14626; 71 FR 19244

EXHIBIT 2-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION



40. Incremental impacts may be the direct compliance costs associated with additional effort to forecast consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., developing HCPs in an effort to avoid designation of critical habitat), triggering of additional requirements under State or local laws intended to protect sensitive habitat, and uncertainty and perceptional effects on markets.

Direct Impacts

41. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid or minimize potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

42. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat. Administrative efforts for consultation may therefore result in both baseline and incremental impacts.

43. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

    1. **Additional effort to address adverse modification in a new consultation -** New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.

    2. **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.

3. **Incremental consultation resulting entirely from critical habitat designation -** Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs of incremental consultations are considered incremental impacts of the designation.

44. The administrative costs of these consultations vary depending on the specifics of the project. One way to address this variability is to show a range of possible costs of consultation, as it may not be possible to predict the precise outcome of each future consultation in terms of level of effort. Review of consultation records and discussions with Service field offices resulted in a range of estimated administrative costs of consultation. For simplicity, the average of the range of costs in each category is applied in this analysis.

45. Exhibit 2-2 provides estimated administrative consultation costs representing effort required for all types of consultation, including those that considered both adverse modification and jeopardy. To estimate the fractions of the total administrative consultation costs that are baseline and incremental, the following assumptions were applied.

- The greatest effort will be associated with consultations that consider both jeopardy and adverse modification. Depending on whether the consultation is precipitated by the listing or the critical habitat designation, part or all of the costs, respectively, will be attributed to the proposed rule.
- Efficiencies exist when considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations precipitated by the listing result in the least incremental effort, roughly one-quarter of the cost of the entire consultation. The remaining three-quarters of the costs are attributed to consideration of the jeopardy standard in the baseline scenario. This latter amount also represents the cost of a consultation that only considers adverse modification (e.g., an incremental consultation for activities in unoccupied critical habitat) and is attributed wholly to critical habitat.
- Incremental costs of the re-initiation of a previously completed consultation because of the critical habitat designation are assumed to be approximately half the cost of a consultation considering both jeopardy and adverse modification. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species. However, because the previously completed effort must be re-opened, they are more costly

EXHIBIT 2-2 RANGE OF ADMINISTRATIVE CONSULTATION COSTS (2008 DOLLARS)

BASELINE ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	**SERVICE**	**FEDERAL AGENCY**	**THIRD PARTY**	**BIOLOGICAL ASSESSMENT**	**TOTAL COSTS**
NEW CONSULTATION CONSIDERING JEOPARDY (DOES NOT INCLUDE CONSIDERATION OF ADVERSE MODIFICATION)					
Technical Assistance	$405	n/a	$788	n/a	$1,130
Informal	$1,760	$2,250	$1,540	$1,500	$7,130
Formal	$3,980	$4,500	$2,630	$3,600	$15,000
Programmatic	$12,000	$9,940	n/a	$4,200	$26,100
INCREMENTAL ADMINISTRATIVE COSTS OF CONSULTATION					
CONSULTATION TYPE	**SERVICE**	**FEDERAL AGENCY**	**THIRD PARTY**	**BIOLOGICAL ASSESSMENT**	**TOTAL COSTS**
NEW CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESIGNATION (TOTAL COST OF A CONSULTATION CONSIDERING BOTH JEOPARDY AND ADVERSE MODIFICATION)					
Technical Assistance	$540	n/a	$1,050	n/a	$1,500
Informal	$2,350	$3,000	$2,050	$2,000	$9,500
Formal	$5,300	$6,000	$3,500	$4,800	$20,000
Programmatic	$16,000	$13,300	n/a	$5,600	$34,800
NEW CONSULTATION CONSIDERING ONLY ADVERSE MODIFICATION (UNOCCUPIED HABITAT)					
Technical Assistance	$405	n/a	$788	n/a	$1,130
Informal	$1,760	$2,250	$1,540	$1,500	$7,130
Formal	$3,980	$4,500	$2,630	$3,600	$15,000
Programmatic	$12,000	$9,940	n/a	$4,200	$26,100
RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION					
Technical Assistance	$270	n/a	$525	n/a	$750
Informal	$1,180	$1,500	$1,030	$1,000	$4,750
Formal	$2,650	$3,000	$1,750	$2,400	$10,000
Programmatic	$7,980	$6,630	n/a	$2,800	$17,400
ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION (ADDITIVE WITH BASELINE COSTS ABOVE OF CONSIDERING JEOPARDY)					
Technical Assistance	$135	n/a	$263	n/a	$375
Informal	$588	$750	$513	$500	$2,380
Formal	$1,330	$1,500	$875	$1,200	$5,000
Programmatic	$3,990	$3,310	n/a	$1,400	$8,700

Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2008, and a review of consultation records from several Service field offices across the country conducted in 2002.

Notes:
1. Totals may not sum due to rounding.
2. Estimates reflect average hourly time required by staff.

than simply adding consideration of critical habitat to a consultation already underway.

Section 7 Project Modification Impacts

46. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, the economic impacts of project modifications undertaken to avoid or minimize adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.

1. **Additional effort to address adverse modification in a new consultation** - Only project modifications above and beyond what would be requested to avoid or minimize jeopardy are considered incremental.
2. **Re-initiation of consultation to address adverse modification -** Only project modifications above and beyond what was requested to avoid or minimize jeopardy are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation -** Impacts of all project modifications are considered incremental.

Indirect Impacts

47. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions, and that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. Importantly, these types of impacts are not always considered incremental. In the case that these types of conservation efforts and economic effects are expected to occur regardless of critical habitat designation, they are appropriately considered baseline impacts in this analysis.

Habitat Conservation Plans

48. Under section 10 of the Act, landowners seeking an incidental take permit must develop an HCP to counterbalance the potential harmful effects that an otherwise lawful activity may have on a species. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately avoided or minimized. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.

49. Application for an incidental take permit and completion of an HCP are not required or necessarily recommended by a critical habitat designation. However, in certain situations

the new information provided by the proposed critical habitat rule may prompt a landowner to apply for an incidental take permit. For example, a landowner may have been previously unaware of the potential presence of the species on his or her property, and expeditious completion of an HCP may offer the landowner regulatory relief in the form of exclusion from the final critical habitat designation. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation. No specific plans to prepare new HCPs in response to this proposed designation were identified.

Other State and Local Laws

50. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

51. The California Environmental Quality Act (CEQA), for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were "categorically exempt" from preparing an Environmental Impact Report (EIR) under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.

Additional Indirect Impacts

52. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:

- **Time Delays -** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty -** The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes

available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation. In this specific analysis, information is not available to quantify this effect.

- **Stigma -** In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation. Data limitations prevent the quantification of stigma effects resulting from frog conservation efforts.

2.3.3 BENEFITS

53. Under E.O. 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[29] OMB's Circular A-4 distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.[30]

54. In the context of critical habitat, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing E.O. 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.[31] *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

55. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements

[29] E.O. 12866, Regulatory Planning and Review, September 30, 1993.

[30] U.S. Office of Management and Budget, "Circular A-4," September 17, 2003, available at http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf.

[31] Ibid.

(PCEs) on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

56. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment in this report. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact. Where data are available, this analysis attempts to capture the *net* economic impact (i.e., the increased regulatory burden less any discernable offsetting market gains), of species conservation efforts imposed on regulated entities and the regional economy.

2.3.4 GEOGRAPHIC SCOPE OF THE ANALYSIS

57. The geographic scope of the analysis includes all land proposed as critical habitat. Note the economic impacts may by sited outside of the boundaries of the study area (e.g., pesticide use buffers); these impacts are considered relevant to this analysis. The study area does not include lands previously designated as critical habitat that are not included in this proposed revision.

58. Results are presented by proposed critical habitat unit in most tables. Where significant impacts result from specific parcels within units, these parcels and the associated costs are identified in the text and summary tables included in the Executive Summary. Appendix B presents detailed results by census tract.

2.3.5 ANALYTIC TIME FRAME

59. The analysis estimates impacts based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis estimates economic impacts to activities from 1996 (year of the species' final listing) to 2030, 22 years from the expected year of final critical habitat designation(based on development project forecasts obtained from local planning authorities). Estimated impacts are divided into pre-designation (1996- 2008) and post-designation (2009-2030) impacts.[32]

[32] As described in the Proposed Rule, the Service first designated critical habitat for this species in 2001 (66 FR 14626). "Pre-designation" and "post-designation" in this report refer to the revised final critical habitat designation expected in 2009.

2.4 INFORMATION SOURCES

60. The primary sources of information for this report are communications with, and data provided by, personnel from the Service, Federal, State, and local governments and other stakeholders. In addition, this analysis relies upon the Service's section 7 consultation records and draft management plans prepared by various government agencies. A complete list of references is provided at the end of this document.

CHAPTER 3 | BASELINE REGULATIONS

61. The conservation and protection of endangered species takes place at multiple levels in the State of California, under a complex web of regulation and permitting processes designed to protect sensitive species and their habitat. Specifically, the frog receives protection at the Federal level, under the Act and at the State level under the California Endangered Species Act (CESA) and CEQA. Layered over this regulatory framework are geographically specific factors which also contribute to treatment of the frog and its critical habitat.

62. Below, we summarize the baseline protections provided by Federal, State and local statutes and regulations that may affect proposed critical habitat areas. For each baseline element, we discuss the general methodology that this analysis will use to differentiate baseline versus incremental impacts. Exhibit 3-1 depicts the general framework regarding whether an impact should be considered incremental. The following sections describe this framework in detail.

3.1 FEDERAL ESA LISTING

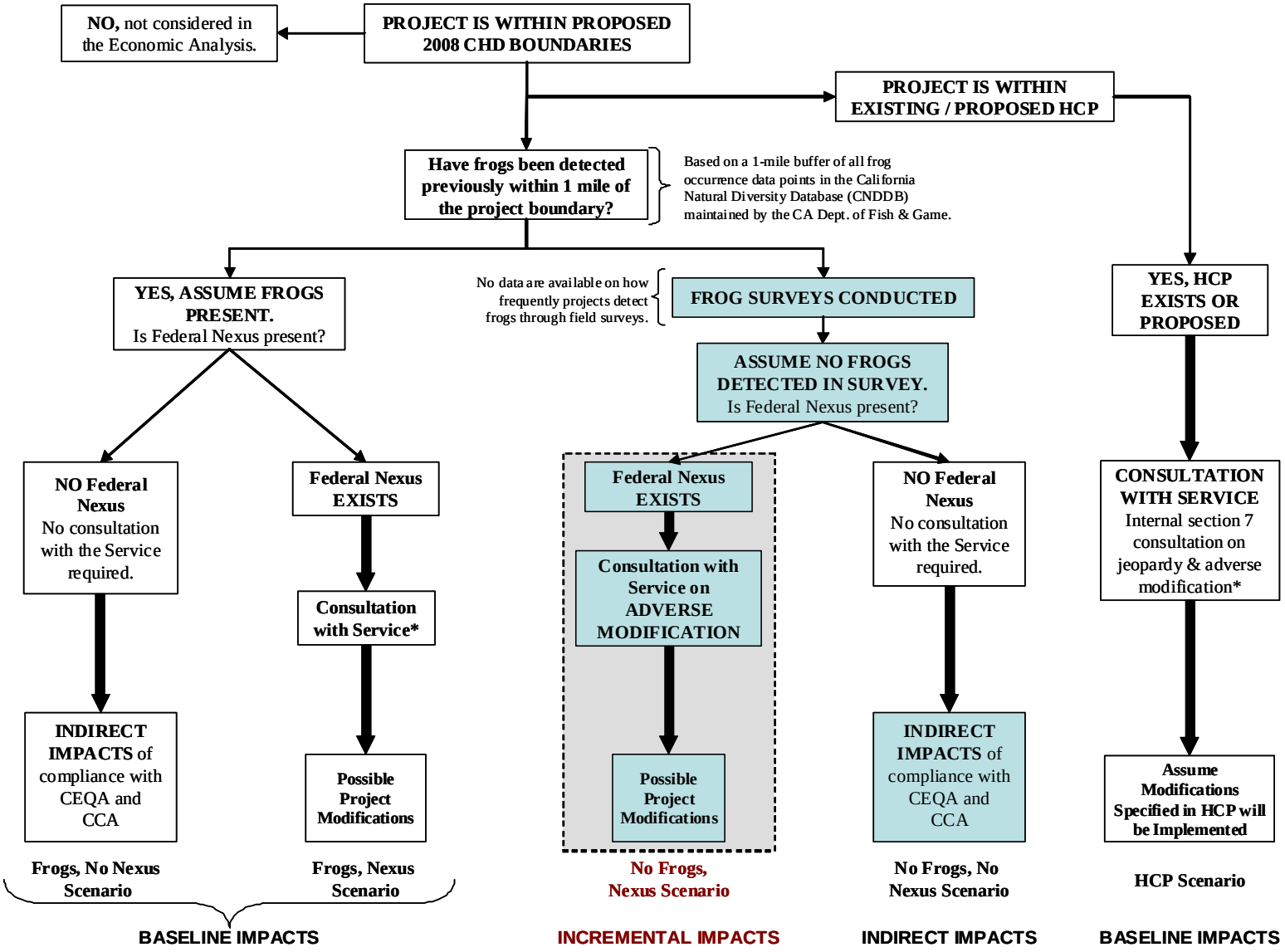
3.1.1 GUIDANCE ON FROG SITE ASSESSMENTS AND FIELD SURVEYS

63. On May 23, 1996, the Service listed the frog as an endangered species under the Act. Under the listing, Federal agencies must consult with the Service regarding any actions they fund, authorize, permit or carry out that may affect the listed species. The listing of the frog is the most significant aspect of baseline protection, as it makes it illegal for any person to "take" the species without a permit from the Service.[33] In order to prevent take of frogs, on February 18, 1997 the Service issued guidance on conducting site assessments and surveys for the frog before commencing new land-altering activities. This guidance was revised by the Service in August 2005 based on the review of numerous site assessments and survey results collected by the Service since the listing of the species in 1996.[34]

[33] "Take" means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." (16 U.S.C. 1532)

[34] U.S. FWS. 2005. *Revised Guidance on Site Assessment and Field Surveys for the California Red-legged Frog*, August 2005. Available online at: http://www.fws.gov/sacramento/es/documents/crf_survey_guidance_aug2005.PDF

EXHIBIT 3-1 GENERAL METHODOLOGY TO IDENTIFY AND SEPARATE BASELINE AND INCREMENTAL IMPACTS



* Minor administrative costs of adding adverse modification to consultation are counted as incremental impacts.

64. The survey protocol recommends two procedures to aid landowners and project developers in assessing the likelihood of frog presence on their property or in the vicinity of the proposed project area: (1) conduct an assessment of frog occurrence records within a one-mile radius of the project site; and (2) if habitat is present but no historical frog occurrences are identified within a one-mile radius of the project site, arrange for a qualified biologist to conduct focused field surveys of breeding pools and other associated habitat to determine whether frogs are likely to be present. [35]

Procedure 1: Site Assessment

65. Specifically, the survey protocol recommends the use of the California Natural Diversity Data Base (CNDDB) maintained by the California Department of Fish and Game (CA DFG) Natural Heritage Division to determine if there are reported occurrences of the frog within a one-mile radius of the project site. The CNDDB is a program that inventories the location of rare and endangered plants, animals and natural communities in California. Including over 40,000 location records (as of 2001), CNDDB acts as a repository of reported sightings of rare species and natural communities and is updated on a regular basis as new data becomes available. In addition to the CNDDB, the Service identifies a number of other sources available to augment the CNDDB, including site-specific assessments of habitat connectivity, biological consultants, local residents, amateur herpetologists, resource managers and biologists from municipal, State, and Federal agencies, environmental groups and museums and universities. However, discussions with Service staff as well as preliminary calls with a number of county planning departments confirms that the CNDDB is the most well-known resource used by landowners and project proponents to determine frog presence.[36] Accordingly, this analysis relies on the CNDDB to identify areas where frogs are assumed to be present. The CNDDB contains 971 occurrence records for the frog. Applying a one-mile buffer to these data points within the proposed critical habitat boundaries results in a total of 604 occurrence records and an area of approximately 588,737 acres, or 53 percent of the total area proposed for critical habitat. Impacts to projects that fall within these areas will be considered baseline for this analysis. To the extent that site-specific information available to the Service may result in a determination of frog presence, for example based on habitat connectivity, areas considered as baseline for this analysis may be under-estimated.

Procedure 2: Field Surveys

66. If no known occurrences of the frog are identified through the CNDDB, but frog habitat is present, the survey protocol recommends having a qualified biologist conduct up to eight focused field surveys to determine frog presence at or near the project site. Each survey must take place at least seven days apart, and the survey period must be conducted

[35] The one-mile radius is a general guideline. The Service may advise an alternate distance based on site-specific conditions on a case-by-case basis.

[36] Personal communication with Arnold Roessler, U.S. Fish and Wildlife Service, November 5, 2008; Personal communication with Jody Lyons, Monterey County Planning, November 19, 2008; Personal communication with Claudia Slater, Santa Cruz Planning Department, November 14, 2008.

over a minimum period of six weeks. If focused field surveys find no frogs in or near the project area, no section 7 consultation (or resulting project modifications) would likely have been required because the activity would be presumed not to affect the frog. In contrast, all projects taking place on critical habitat lands will likely require some form of section 7 consultation, regardless of whether biological surveys actually find frogs, in order to address potential adverse modifications to critical habitat.[37] As a result, critical habitat designation could potentially impose incremental consultation costs as well as new project modifications.

67. Ideally this analysis would rely on data about the frequency that field surveys result in detection of the frog, however, according to discussions with the Service, data on the results of focused field surveys are not tracked and currently unavailable. Accordingly, this analysis conservatively assumes that frogs will not be detected by field surveys outside of known frog occurrences from the CNDDB, and therefore projects that fall within these areas will be considered incremental impacts for this analysis.[38] To the extent that field surveys detect frogs, this analysis may under-estimate baseline impacts and over-estimate incremental impacts. Exhibits 3-2 and 3-3 present proposed critical habitat areas where the frog would likely be detected (i.e., within one-mile of a CNDDB frog occurrence) and those areas where the frog would not likely be detected (i.e., incremental).

[37] According to the Service, site-specific assessment of a project may conclude that the proposed activity would not adversely affect PCEs and therefore formal consultation would not be required. To the extent that project activities taking place on critical habitat lands do not result in adverse impacts to PCEs, this analysis may over-estimate incremental impacts.

[38] According to the Service, "[t]he proposed critical habitat units for the California red-legged frog (frog) represent habitat-based population distributions associated with known occurrence records for this species…[t]he habitat-based population distributions, which are the basis for delineation of most critical habitat unit areas within a watershed, predict the geographic habitat areas needed for long-term conservation of the California red-legged frog populations associated with each core occurrence complex." (Memorandum provided by U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, "Comments on how DEA Should Estimate Incremental Costs for the California Red-legged Frog Critical Habitat Designation," November 20, 2008.) Therefore, although each unit is assumed by the Service to be currently occupied, the frog likely moves between the aquatic (breeding and non-breeding), upland, and dispersal habitat within these units. Therefore, depending on the time of year and the habitat type located within a particular project site, surveys may not identify the frog. At the writing of this report, the Service is unable to provide more precise information about the likelihood that a given field survey will confirm the presence of the frog.

EXHIBIT 3-2 PROPOSED CRITICAL HABITAT AREAS WITHIN ONE-MILE BUFFER OF CNDDB

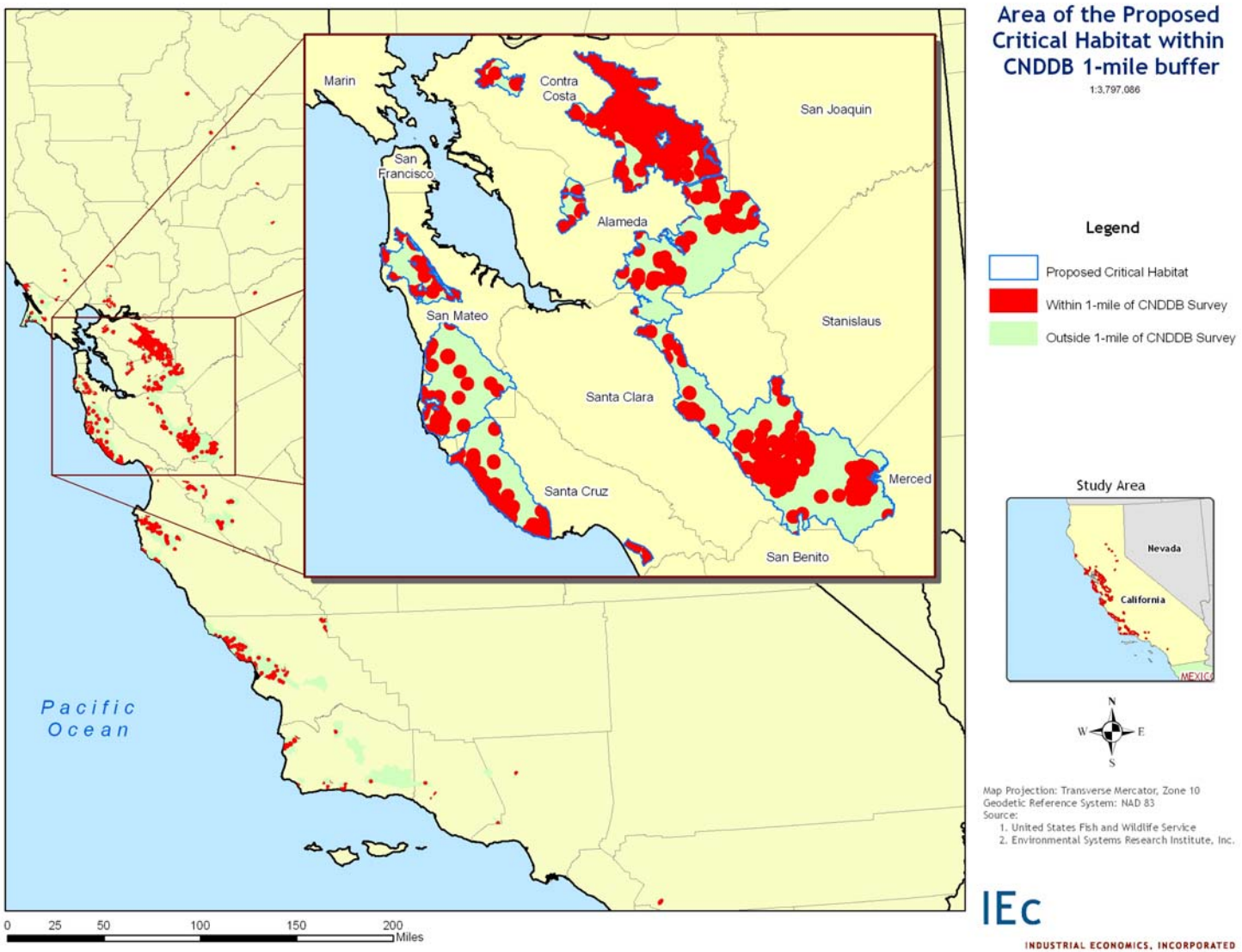


EXHIBIT 3-3 PROPOSED CRITICAL HABITAT AREAS WITHIN ONE-MILE BUFFER OF CNDDB BY UNIT

UNIT	BASELLINE ACRES	INCREMENTAL ACRES	PERCENT INCREMENTAL	TOTAL ACRES
ALA-1A	2,278	1,372	38%	3,650
ALA-1B	6,645	3,523	35%	10,168
ALA-2	60,369	93,255	61%	153,624
BUT-1	2,591	2,702	51%	5,293
CAL-1	2,004	2,445	55%	4,449
CCS-1	8,939	4,919	35%	13,858
CCS-2	127,063	11,795	8%	138,858
ELD-1	1,607	3,918	71%	5,525
LOS-1	1,872	2,359	56%	4,231
MEN-1	5,115	18,790	79%	23,905
MNT-1	519	0	0%	519
MNT-2	50,023	69,469	58%	119,492
MNT-3	5,819	21,723	79%	27,542
MRN-1	5,884	1,956	25%	7,840
MRN-2	2,211	20,348	90%	22,559
MRN-3	7,647	26,281	77%	33,928
NAP-1	1,955	569	23%	2,524
NEV-1	2,214	6,072	73%	8,286
PLA-1	1,244	0	0%	1,244
RIV-1	4,069	0	0%	4,069
SCZ-1	37,041	35,214	49%	72,255
SCZ-2	3,932	125	3%	4,057
SLO-1	8,355	9,663	54%	18,018
SLO-2	48,184	69,265	59%	117,449
SLO-3	38,943	83,477	68%	122,420
SLO-4	0	34,463	100%	34,463
SNB-1	17,620	18,674	51%	36,294
SNB-2	5,452	11,904	69%	17,356
SNB-3	12,661	51,093	80%	63,754
SNM-1	20,488	14,464	41%	34,952
SNM-2	35,921	60,218	63%	96,139
SOL-1	6,908	5,063	42%	11,971
SOL-2	642	2,718	81%	3,360
SOL-3	3,165	1,432	31%	4,597
SON-1	1,564	0	0%	1,564
SON-2	1,639	3,293	67%	4,932
SON-3	2,106	124	6%	2,230
STB-1	2,551	22,614	90%	25,165
STB-2	13,792	22,212	62%	36,004
STB-3	0	47,559	100%	47,559

UNIT	BASELLINE ACRES	INCREMENTAL ACRES	PERCENT INCREMENTAL	TOTAL ACRES
STB-4	1,043	7,650	88%	8,693
STB-5	3,804	9,084	70%	12,888
STB-6	5,629	6,356	53%	11,985
STB-7	4,395	140,726	97%	145,121
STC-1	20,848	31,435	60%	52,283
STC-2	94,299	110,419	54%	204,718
VEN-1	1,839	1,076	37%	2,915
VEN-2	0	8,837	100%	8,837
VEN-3	1,672	3,328	67%	5,000
YUB-1	2,206	4,116	65%	6,322
Total	**696,770**	**1,108,095**	**61%**	**1,804,865**

3.1.2 RECOVERY PLAN

68. Another important component of the baseline scenario is the Recovery Plan, finalized in 2002. The plan includes a map delineating recovery units for the frog, as well as the methodology employed in determining its distribution. All of the proposed critical habitat units fall within the recovery units delineated by the Recovery Plan. While the Recovery Plan imposes no binding restrictions or regulatory burden on landowners and managers, it serves as an important information source for landowners regarding conservation needs for frog habitat areas. Because this document is made publicly available through the publication of a Notice of Availability in the Federal Register, it publicizes information about frog habitat requirements and sighting locations. In conjunction with the CNDDB, the Recovery Plan provides information to the public about areas likely to be subject to consultation with the Service.

3.1.3 SPECIAL RULE EXEMPTION FOR ROUTINE RANCHING ACTIVITIES[39]

69. Another important component of the baseline scenario is the Special Rule Exemption issued in 2006 for routine ranching activities. Section 4(d) of the Act provides the Service the authority to publish a special rule that modifies the standard protections for threatened species under the Service's regulations implementing section 9 of the Act with special measures tailored to the conservation of the species. In the 2006 final rule designating critical habitat, the Service identified the continuing loss of aquatic breeding and associated uplands as among the greatest threats to the frog. Without these natural habitats, the Service highlighted alternative breeding sites as "critical for the continued survival" of the frog.[40] Stock pond and small reservoir impoundments created as a part of livestock ranching activities have become an important source of alternative breeding sites for the frog. Accordingly, in recognition of the beneficial (or neutral) impact that managed livestock grazing at low to moderate levels has on frog habitat, the Service issued a Special Rule under section 4(d) exempting routine ranching activities on non-

[39] 71 FR 19244.

[40] Ibid.

Federal lands from prohibitions against take in order to encourage continued responsible land uses that provide an overall benefit to the species. Consequently, under the Special Rule Exemption for routine ranching activities, this analysis assumes ranchers on non-Federal lands will not experience any economic impacts with respect to routine ranching activities due to critical habitat designation.

3.1.4 HABITAT CONSERVATION PLANS

70. Future impacts resulting from past decisions incorporating critical habitat concerns (e.g., the impacts associated with existing HCPs that incorporated the boundaries of the former designation) are also assigned to the baseline. Three existing HCPs include conservation measures for the frog within acres considered for exclusion from the proposed critical habitat designation:

- **The Western Riverside MSHCP**. The Western Riverside MSHCP is "a comprehensive, multi-jurisdictional HCP focusing on conservation of species and their associated habitats in Western Riverside County."[41] The MSHCP addresses 146 listed and unlisted "covered" species, including the frog. Conservation objectives included in the MSHCP specific to the frog include the conservation of occupied and historical breeding habitat, intervening lands that provide for movement between core areas and upland habitat adjacent to occupied or suitable breeding habitat. Completed in 2003, the measures undertaken as part of this MSHCP are likely to occur in the absence of designated critical habitat and are attributed to the baseline.
- **The East Contra Costa County HCP (ECCHCP)**. The ECCHCP provides regional conservation and development guidelines to protect natural resources while improving and streamlining the permit process for endangered species and wetland regulations. Participants in the HCP include the County of Contra Costa, and four (4) cities, including Brentwood, Clayton, Oakley, and Pittsburgh, California. Recently finalized on July 25, 2007, conservation measures for the frog included in this HCP are likely to occur in the absence of designated critical habitat and therefore are attributed to the baseline.
- **The Bonny Doon Quarries Settlement Ponds HCP**. The Bonny Doon HCP encompasses approximately 6 acres of privately-owned lands in the Santa Cruz Mountains near the town of Davenport. The Bonny Doon HCP contains measures to minimize and mitigate impacts to the frog and its habitat from the operations, maintenance, and possible reclamation activities and to further conservation of the frog. The Bonny Doon HCP was finalized in 1998 and therefore is not likely to be affected by the decision to re-designate these areas as critical habitat.

[41] Riverside County MSHCP. Available at: http://www.rctlma.org/mshcp/index.html

3.2 STATE STATUTES AND REGULATIONS

3.2.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)[42]

71. CEQA requires the identification of the environmental effects of proposed projects that have the potential to harm sensitive species or habitat (state- or federally-listed). CEQA requires State and local agencies ("the lead agency") to determine whether a proposed project would have a "significant" impact on the environment, and for any such impacts identified, determine whether feasible mitigation measures or feasible alternatives will reduce the impact to a less-than-significant level. Under CEQA, the lead agency typically requires projects that may impact sensitive species or habitat to undertake a biological assessment by a qualified biologist to determine the potential for impacts to all rare, threatened and endangered species. Section 15065 of Article 5 of the CEQA regulations states that a finding of significance is mandatory if the project will:

> "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

If the lead agency finds that a project causes significant impacts, the project proponent must prepare an EIR.

72. CEQA requirements already play a role in requiring environmental review for projects that may impact the frog. To identify projects that may impact the frog, preliminary discussions with county planning departments indicate that the most consistently used resource is the CNDDB. Similar to the Service's August 2005 survey protocol, planning department staff also use additional site-specific resources to augment this information, including focused field surveys. Where the frog is identified as present at a project site, the CEQA process is not expected to change after designation of critical habitat. Costs associated with these projects are assumed to be attributable to the baseline.

73. In cases where the species is not detected, this analysis proposes to use the same approach as previously discussed above – assuming that the frog is not detected in areas without a history of CNDDB occurrence records and attributing CEQA-related impacts to projects in these areas as incremental to the rule.

3.2.2 CALIFORNIA COASTAL ACT (CCA)

74. The California Coastal Act (CCA) protects California's coast through the implementation of policies at the State and local government level that safeguard the State's coastal resources. The CCA defines the "coastal zone" as the area of the State which extends three miles seaward and about 1,000 yards inland, up to a maximum of 5 miles inland from the mean high tide line. Under the CCA, each of the 53 cities and 15 counties

[42] Economic & Planning Systems, "Draft Economic Analysis of Critical Habitat Designation for San Diego Fairy Shrimp," prepared for the U.S. Fish and Wildlife Service, April 2004.

within the coastal zone is required to prepare a Local Coastal Program (LCP), which is certified by the Coastal Commission. LCPs articulate the measures used by the city or county to implement the policies of the CCA and provide the overarching regulatory framework for issuance of permits for all development within the coastal zone.[43]

75. CCA defines environmentally sensitive habitat areas (ESHAs) as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments."[44] Development in ESHAs must be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.[45] Exhibit 3-4 summarizes proposed critical habitat within the coastal zone by County.

EXHIBIT 3-4 PROPOSED CRITICAL HABITAT AREAS IN THE COASTAL ZONE BY COUNTY

COUNTY	PCHD (ACRES)
Marin	25,891
Mendocino	2,422
Monterey	18,720
San Luis Obispo	82,217
San Mateo	58,088
Santa Barbara	21,176
Santa Cruz	48,684
Sonoma	520
Total	**257,718**

Source: GIS data of the California Coastal Zone obtained from the California Coastal Commission.

[43] In the absence of a LCP for a specific city or county, coastal development permits are issued by the Coastal Commission.

[44] California Public Resources, Accessed November 26, 2008. http://law.justia.com/california/codes/prc /30240-30244.html

[45] California Public Resources, Accessed November 26, 2008. http://www.leginfo.ca.gov/cgi-bin/displaycode?section=prc&group=30001-31000&file=30240-30244

CHAPTER 4 | URBAN DEVELOPMENT

76. Urban development may result in the loss and fragmentation of frog habitat and may disrupt habitat connectivity.[46] Exhibit 4-1 presents an overall summary of impacts to development activities. This chapter first reviews past impacts to development projects in the study area. Next, the chapter summarizes the methodological steps necessary to estimate future development impacts. These steps are then applied and baseline and incremental post-designation impacts are presented separately. This chapter concludes with a discussion of the sources of uncertainty in this analysis.

EXHIBIT 4-1 SUMMARY OF IMPACTS TO DEVELOPMENT ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

VALUES	LOW	HIGH
Post-Designation Baseline Impacts (2009 – 2030)		
Present Value of Impacts	$1,190,000,000	$1,270,000,000
Annualized Impact Value	$110,000,000	$118,000,000
Incremental Impacts (2009 – 2030)		
Present Value of Impacts	$564,000,000	$597,000,000
Annualized Impact Value	$53,700,000	$56,700,000

4.1 PRE-DESIGNATION IMPACTS

77. Since the listing of the species, there have been 31 consultations for the frog on development projects. Of these, approximately 29 consultations occurred within the study area, or approximately four per year. Exhibit 4-2 summarizes past consultations by county. Examples of conservation measures required in past consultations on development activities include:

- Pre-construction survey, capture and removal of any frogs by qualified biologists;
- Education of project personnel;
- Creation of frog habitat and/or additional open space or wildlife;
- Project site revegetation or habitat restoration;
- Exotic species removal; and

[46] 61 FR 25824

- Seasonal work restrictions.

EXHIBIT 4-2 PAST DEVELOPMENT CONSULTATIONS BY COUNTY (1996-2008)

COUNTY	NO. OF CONSULTATIONS
Alameda	6
Contra Costa	5
El Dorado	1
Monterey	1
Placer	1
San Benito	1
San Joaquin	1
San Mateo	2
Santa Barbara	4
Santa Clara	3
Santa Cruz	1
Solano	2
Sonoma	1
Total	**29**

78. In addition, as previously discussed in Chapter 2, there are two existing HCPs within the study area that affect urban development projects. The Western Riverside MSHCP and the East Contra Costa County HCP include conservation measures for the frog within acres considered for exclusion in RIV-1 (4,097 acres) and CCS-2 (92,592 acres), respectively. Below we describe each HCP in more detail.

- The **Western Riverside MSHCP** differs from other HCPs in that it is a criteria-based plan, wherein each cell (a geographical unit generally 160 acres in size) is ascribed specific conservation criteria. The Criteria Area is the area in which the MSHCP conservation criteria will be applied and in which 153,000 acres of new conservation will be designated to contribute toward assembly of the overall MSHCP conservation goals, including conserving the frog. The development of the Western Riverside MSHCP was completed and adopted in June 2003. It is unlikely that the plan will be revised based on the currently proposed revisions to critical habitat, as such no new project modifications are likely to result from the final rule. Costs resulting from the implementation of the plan are attributed to the existing, baseline regulation.
- The **East Contra Costa County HCP** is a comprehensive, multi-jurisdictional plan that encompasses 174,018 acres in eastern Contra Costa County. The plan provides for regional species conservation and habitat planning while allowing local land-use authorities to manage future growth and development. Specifically, the plan establishes two permit areas: (1) an initial urban

development area (IUDA) that authorizes where urban development of 9,796 acres; and (2) a maximum urban development area (MUDA) that authorizes up to 13,029 acres of urban development. The primary conservation measure to offset development within these two permit areas involves the creation of a Preserve System in which new conservation of approximately 23,800 acres will be created within the IUDA and approximately 30,300 acres of land under the MUDA. Specifically for the frog, according to the Biological Opinion, the Preserve System will protect an estimated 28 or 36 acres of modeled non-stream breeding habitat, 85 or 98 miles of stream breeding habitat, and 24,455 or 29,467 acres of upland dispersal habitat within the IUDA and MUDA, respectively.[47] Funding of the Preserve System will be generated through payment of mitigation fee by developers prior to issuance of development permits by local planning authorities. The plan was finalized and adopted in 2007, it is unlikely that the plan will be revised based on the currently proposed revisions to critical habitat, as such no new project modifications are likely to result from the final rule. Costs resulting from the implementation of the plan are attributed to the existing, baseline regulation.

4.2 METHODOLOGY FOR ESTIMATING POST-DESIGNATION IMPACTS

79. To identify and estimate future impacts to residential and commercial development projects in areas proposed for critical habitat designation, this analysis will employ a five-step process. These steps are summarized below. Note that information and data obtained in the first three steps is combined simultaneously to accomplish Steps 4 and 5.

- **Step 1 – Forecast future development activity within the study area.** The identification of potentially affected developable land relies on two pieces of information: (1) projections of the amount of development forecast to occur over the next 22 years (i.e., through the year 2030); and (2) information about the geographic location of anticipated development. Specifically, this analysis relies on local planning authorities for estimates of the number of housing units projected to be built by 2030 in the census tracts encompassing the study area.[48] The analysis relies on a statistically-based growth allocation model developed by BEC to allocate growth projection data spatially within census tracts.
- **Step 2 – Determine whether a Federal nexus is present**. Based on discussions with the Home Builders Association of Northern California, this

[47] U.S. Fish and Wildlife Service. 2007. Intra-Service Biological Opinion on Issuance of Section 10(a)(B) Incidental Take Permit for the Contra Costa County, the Contra Costa Flood Control and Water Conservation District, the East Bay Regional Park District, and the Cities of Brentwood, Clayton, Oakley, and Pittsburg for Implementation of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan. July 20, 2007.

[48] Use of data from local planning authorities incorporates expertise regarding local growth trends and development characteristics. This analysis gathered data from the following local planning authorities: ABAG, SACOG, AMBAG, SLOCOG, SBCAG, and SCAG [define acronyms]. Where these data are not available, supplemental demographic data was relied upon from Applied Geographic Solutions (AGS).

analysis assumes that a Federal nexus would be present for 80 percent of projects within proposed critical habitat areas.[49]

- **Step 3 – Determine whether the frog will be detected in future development sites**. As previously described in Chapter 3, the Service issued guidance to aid landowners and project developers in assessing the likelihood of frog presence on a parcel of property. Accordingly, this analysis relies on the CNDDB to identify areas where landowners and project developers are likely to detect frogs.
- **Step 4 – Distinguish between actions resulting from baseline regulations and the proposed critical habitat rule**. Baseline impacts occur in areas where landowners and project developers can reasonably expect to detect frogs – that is, areas within a one-mile radius of the CNDDB. Incremental impacts occur in areas where the frog would not be detected – outside the one-mile radius of the CNDDB.
- **Step 5 – Estimate Direct Impacts**. Three types of direct impacts will be estimated:[50]

  (1) **Administrative costs** of participating in consultations.

  (2) **Project modifications** estimated by applying typical conservation measures defined by the Service to address development impacts.[51]

  (3) **Project delays** associated with section 7 consultation are estimated based on the opportunity costs of owning the undeveloped acres during the time period historically required to complete the process.
- **Step 6 – Estimate Indirect Impacts.** Indirect impacts of administrative costs, delay costs and possible project modifications associated with the CEQA are quantified, and the potential for indirect impacts associated with the CCA are discussed qualitatively.

[49] Electronic communication from Senior Vice President of Governmental Affairs, Home Builders Association of Northern California, December 4, 2008.

[50] As previously described, two existing HCPs, the Western Riverside MSHCP and the East Contra Costa County HCP include conservation measures for the frog within acres considered for exclusion in RIV-1 (4,097 acres) and CCS-2 (92,592 acres), respectively. For areas covered by these HCPs, frog conservation efforts are unlikely to be altered by the designation of critical habitat, therefore costs associated with implementing these conservation efforts would be attributed to the baseline. Ideally, this analysis would quantify the future baseline protections measures undertaken for the frog in the area of critical habitat within the boundaries of existing HCPs. It is anticipated that any information received during the public comment period regarding the characterization and cost of project modifications required by these plans will be included in the final version of this report.

[51] U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office. "Comments on how DEA Should Estimate Incremental Costs for the California Red-Legged Frog Critical Habitat Designation," provided via email on November 20, 2008.

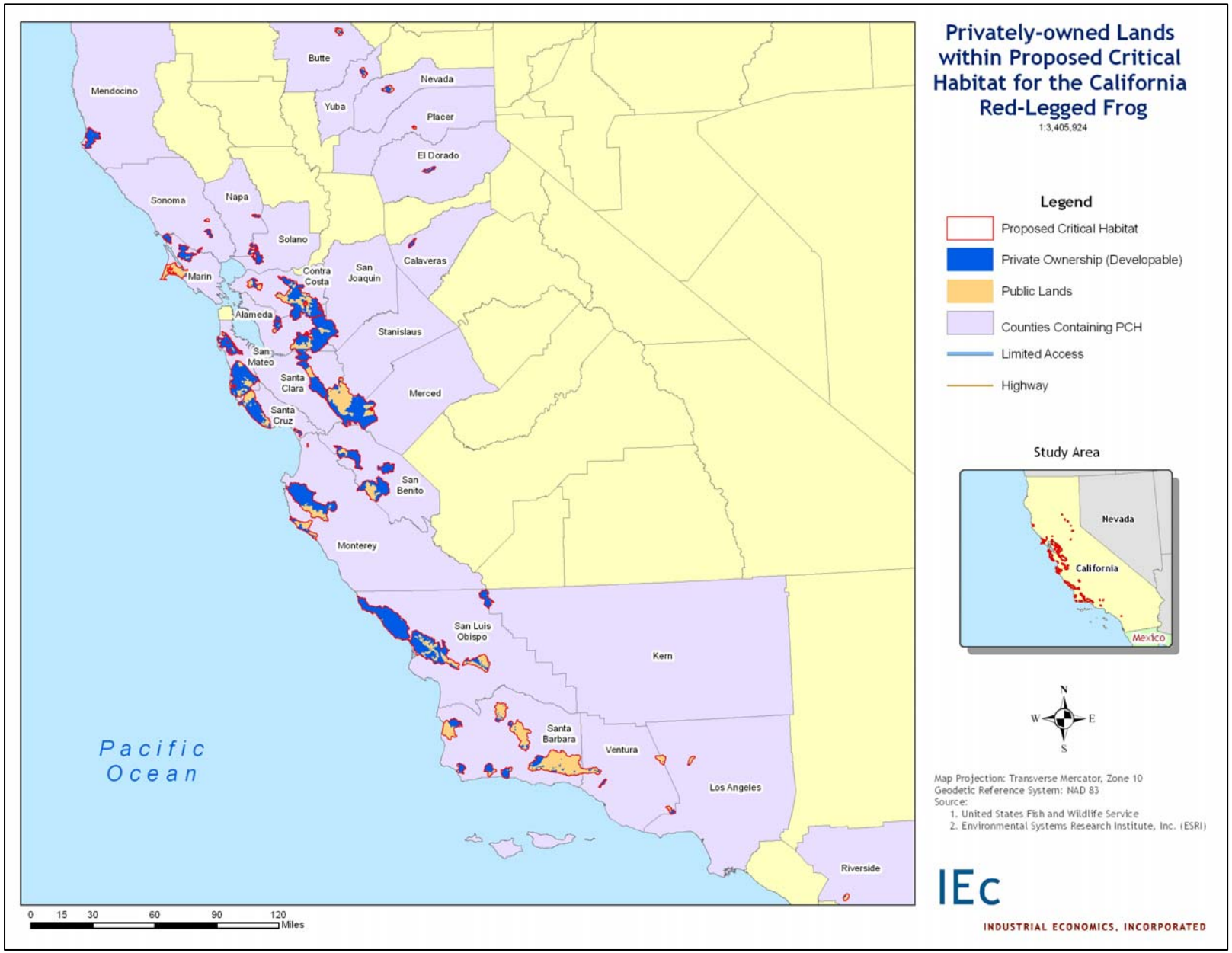
4.3 STEP ONE: FORECAST FUTURE DEVELOPMENT WITHIN THE STUDY AREA

80. Not all lands within the boundaries of proposed critical habitat for the frog can be developed in the future. For example, areas owned by Federal, State, or local governments are unlikely to be converted to housing and related uses. Accordingly, this analysis begins by limiting the study area for development activities to only privately owned lands (1,252,096 acres) based on spatial land ownership data. Exhibit 4-3 presents developable lands within the study area.

81. Not all of this land is likely to be developed within the reasonably foreseeable future. The identification of potentially affected developable land relies on two pieces of information: (1) projections of the amount of development forecast to occur over the next 22 years (i.e., through the year 2030); and (2) information about the geographic location of anticipated development. Specifically, this analysis relies on local planning authorities for estimates of the number of housing units projected to be built by 2030 in the census tracts encompassing the study area. The study area for this analysis extends across 28 counties from Mendocino and Butte Counties in the north to Riverside County in the south. As a result, available data varies significantly across the study area. A detailed explanation of available data by geographic region is presented in Appendix E.

82. Next, this analysis relies on a statistically-based growth allocation model developed by BEC to allocate growth projection data obtained from local planning authorities spatially within census tracts. Their model incorporates demand variables (e.g., job accessibility and income level), location-specific variables (e.g., freeway proximity); current land-use classifications (e.g., farmland, flood plains); neighborhood variables (e.g., the location of nearest neighbors); and regulatory variables (e.g., incorporated boundaries of cities) to identify the probability that each grid cell of land in the State of California will be developed by 2030. A detailed explanation of the application of BEC's model is also presented in Appendix E.

EXHIBIT 4-3 MAP OF DEVELOPABLE LANDS IN STUDY AREA



83. Exhibit 4-4 summarizes the number of acres likely to be developed by critical habitat unit. As shown, total number of acres likely to be developed in the next 22 years (7,099 acres) accounts for a small portion (less than one percent) relative to the total number of privately owned lands in the study area (approximately 1.3 million acres). Significant growth is not projected because, according to the local planning authority growth projections and the BEC growth allocation model, most proposed critical habitat areas are not suitable for development (e.g. far from more urbanized areas or located in hilly terrain).

EXHIBIT 4-4 NUMBER OF ACRES FORECAST TO BE DEVELOPED BY UNIT

UNIT	ACRES
ALA-1A	145
ALA-1B	215
ALA-2	670
BUT-1	0
CAL-1	301
CCS-1	13
CCS-2	2,343
ELD-1	169
LOS-1	0
MEN-1	58
MNT-1	0
MNT-2	127
MNT-3	1
MRN-1	8
MRN-2	9
MRN-3	9
NAP-1	2
NEV-1	74
PLA-1	6
RIV-1	22
SCZ-1	628
SCZ-2	400
SLO-1	109
SLO-2	241
SLO-3	523
SLO-4	9
SNB-1	7
SNB-2	0
SNB-3	9
SNM-1	73
SNM-2	294

UNIT	ACRES
SOL-1	89
SOL-2	40
SOL-3	106
SON-1	1
SON-2	4
SON-3	22
STB-1	0
STB-2	58
STB-3	0
STB-4	0
STB-5	1
STB-6	37
STB-7	2
STC-1	50
STC-2	198
VEN-1	3
VEN-2	0
VEN-3	12
YUB-1	10
Grand Total	**7,099**

4.4 STEP TWO: IDENTIFY FEDERAL NEXUS

84. Development in red-legged frog habitat typically triggers a Federal nexus between the USACE and the Service. According to California developers, a Federal nexus is triggered in approximately 80 percent of development projects.[52] Therefore, this analysis assumes that a Federal nexus will be triggered on 80 percent of the acres projected for development. Based on this criterion, this analysis forecasts 5,679 acres that will be subject to consultation across the study area.

4.5 STEP THREE: DETERMINE WHETHER THE FROG WILL BE DETECTED IN FUTURE DEVELOPMENT SITES

85. As previously described in Chapter 3, the Service issued guidance to aid landowners and project developers in assessing the likelihood of frog presence on a parcel of property.[53] Specifically, this protocol recommends the use of the CNDDB to assist landowners and project developers to asses the likelihood of frog presence within a one-mile radius of the project site. The CNDDB is a database repository of reported sightings of rare species

[52] Electronic communication with Senior Vice President of Governmental Affairs & General Counsel, Home Builders Association of Northern California December 4, 2008.

[53] US Fish and Wildlife Service, Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog, August 2005, p 3.

and natural communities across California and includes over 600 occurrence records for the frog. This analysis relies on the CNDDB and the Service's survey protocol to identify areas where landowners and project developers are likely to detect frogs. Based on this criterion, approximately 55 percent (or 3,898 acres) of the areas likely to be developed by 2030 with a Federal nexus fall within a one-mile radius of the CNDDB.

4.6 STEP FOUR: DISTINGUISH BETWEEN BASELINE AND INCREMENTAL IMPACTS

86. The preceding steps provide the information necessary to distinguish between baseline and incremental impacts. Activities in areas where the frog is likely to be found (i.e., areas within a one-mile buffer of the CNDDB) and are subject to a Federal nexus are likely to incur administrative consultation costs and may be subject to project modifications. Costs in these areas would be incurred absent critical habitat based on the protection provided by the listing and the widespread knowledge of the potential presence of the species, described in Chapter 3.

87. Incremental impacts may arise from actions in areas where the frog is not likely to be detected (i.e., outside the one-mile radius of the CNDDB), but where a Federal nexus is present (80 percent of the time). As shown in Exhibit 3-1 of Chapter 3, absent critical habitat, explicit protection of the frog would not be anticipated in these situations. However, the designation compels Federal action agencies to consider the potential for land-altering activities to adversely modify critical habitat, even when the frog is not present. For these areas, the administrative costs of consultation and resulting project modifications are attributable to the proposed rule.

88. Additional incremental impacts may result indirectly as a result of requirements under CEQA and other local regulations. For areas where the frog is not likely to be detected, indirect impacts would not likely be triggered absent critical habitat. In areas where the frog is likely to be detected, critical habitat designation is not likely to affect indirect impacts. The potential indirect impacts of the proposed designation are discussed in greater detail in Step 6.

89. Exhibit 4-5 summarizes the result of these first four steps.

EXHIBIT 4-5 FORECAST DEVELOPMENT BY PROJECT LOCATION AND FEDERAL NEXUS PRESENCE

PROJECT LOCATION	FEDERAL NEXUS (80 PERCENT OF THE TIME) (ACRES)	NO FEDERAL NEXUS (20 PERCENT OF THE TIME) (ACRES)	TOTAL (ACRES)
Frog Detected Based on CNDDB	3,898	975	4,873
Frog NOT Detected Based on CNDDB	1,781	445	2,226
Total	**5,679**	**1,420**	**7,099**

4.7 STEP FIVE: ESTIMATE DIRECT IMPACTS

90. The direct baseline and incremental impacts likely to be incurred as a result of urban development projects include administrative consultation costs, potential project modifications, and associated delay costs.

4.7.1 ADMINISTRATIVE COSTS OF CONSULTATION

91. The number of forecast consultations is based on the number of expected development projects that have a Federal nexus. The number of development projects is estimated by dividing the total forecast development acreage inside or outside of the 1-mile radius around the CNDDB by the average size of a development project. This analysis assumes that the average size of a project in the study area is approximately 100 acres.[54] As previously discussed, 80 percent of lands projected for development are expected to have a Federal nexus.

92. Impacts are reported as baseline or incremental based on the expected presence of the frog. That is, if a consultation occurs within the 1-mile radius of the CNDDB, the cost of the consultation is attributed to the baseline.[55] If a consultation is conducted in an area outside of the 1-mile radius around the CNDDB where the frog is not detected, the consultation is reported as incremental. Based on these criteria, approximately 38 consultations are forecast as baseline and 17 consultations as incremental. Average consultation costs (as shown in Exhibit 2-2 in Chapter 2) are applied to the number of predicted formal consultations. The number of consultations are spread evenly across years and over time. The total estimated post-designation consultation costs are presented in Exhibit 4-6.

EXHIBIT 4-6 TOTAL POST-DESIGNATION ADMINISTRATIVE COSTS OF DEVELOPMENT PROJECTS (2009 - 2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	BASELINE	INCREMENTAL
ALA-1A	$7,950	$3,720
ALA-1B	$5,150	$12,100
ALA-2	$23,800	$30,100
BUT-1	$0	$0
CAL-1	$7,800	$16,400
CCS-1	$89	$950
CCS-2	$121,000	$67,300
ELD-1	$4,080	$9,520
LOS-1	$0	$0
MEN-1	$21	$4,670

54 Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the Quino Checkerspot Butterfly," prepared for the U.S. Fish and Wildlife Service, June 2001.

55 Note that a small portion of the administrative costs associated with addressing the adverse modification standard during these consultations is attributed incrementally to critical habitat designation, as shown in Exhibit 2-2 in Chapter 2.

UNIT	BASELINE	INCREMENTAL
MNT-1	$0	$0
MNT-2	$206	$107
MNT-3	$0	$0
MRN-1	$361	$309
MRN-2	$35	$693
MRN-3	$271	$447
NAP-1	$87	$47
NEV-1	$1,650	$4,260
PLA-1	$334	$111
RIV-1	$1,230	$535
SCZ-1	$32,700	$17,900
SCZ-2	$23,800	$8,430
SLO-1	$3,490	$5,310
SLO-2	$8,190	$11,200
SLO-3	$15,700	$26,500
SLO-4	$0	$744
SNB-1	$256	$315
SNB-2	$1	$2
SNB-3	$22	$710
SNM-1	$2,890	$3,000
SNM-2	$8,060	$15,600
SOL-1	$4,280	$2,880
SOL-2	$802	$2,400
SOL-3	$4,650	$3,860
SON-1	$64	$21
SON-2	$106	$204
SON-3	$1,190	$545
STB-1	$0	$2
STB-2	$1,920	$2,720
STB-3	$0	$7
STB-4	$0	$0
STB-5	$11	$37
STB-6	$1,620	$1,380
STB-7	$3	$190
STC-1	$1,190	$2,850
STC-2	$5,320	$10,600
VEN-1	$142	$103
VEN-2	$0	$0
VEN-3	$0	$987

UNIT	BASELINE	INCREMENTAL
YUB-1	$330	$502
Total	**$291,000**	**$270,000**
Note: Totals may not sum due to rounding.		

4.7.2 PROJECT MODIFICATIONS

93. Uncertainty regarding the type of project modifications required to offset impacts to the frog from urban development results in the evaluation of two scenarios.[56] Under the first scenario, the Service may recommend compensating for impacts to the frog and its habitat resulting from residential and commercial development by purchasing land and protecting it for the benefit of the frog. Habitat preservation ratios for the frog depend on three pieces of information: (a) whether the impact is temporary or permanent, (b) the type of frog habitat affected (e.g., aquatic breeding habitat, aquatic non-breeding habitat, or upland dispersal habitat), and (c) whether the frog would be initially detected based on the CNDDB.

94. The 2006 Final Economic Analysis assumed that 55 percent of projects will result in permanent impacts to the frog and 45 percent of projects will result in temporary impacts.[57] Because these are the best readily-available data, this analysis applies the same assumption. For proposed critical habitat where the frog is detected, this analysis assumes a habitat preservation ratio of 6:1 for permanent impacts and 2:1 for temporary impacts. For proposed critical habitat where the frog is not detected, this analysis assumes a habitat preservation ratio 1:1 for both permanent and temporary impacts. [58]

95. The average price per acre at local land conservation banks depends on the type of compensating habitat required. The cost of purchasing land is significantly more expensive if compensation is required to offset impacts to breeding habitat versus dispersal habitat. The average price per acre for breeding habitat is approximately $140,000 per acre while the average price per acre of dispersal habitat is approximately

[56] The scenarios applied in this section are based on written guidance provided by the Service characterizing "typical" outcomes of section 7 consultations for the frog. The Service notes that the actual outcome of individual consultations will vary. For example, the consultation history for this species indicates that some past development projects were subject to avoidance recommendations (i.e., no homes can be built within the proposed project area), however the Service did not include an avoidance recommendation as a likely outcome of future consultations. (Personal and email communications with Arnold Roessler, U.S. Fish and Wildlife Service, Sacramento Field and Wildlife Office, December 2008)

[57] CRA International, "Economic Effects of Critical Habitat for the Red-Legged Frog in 23 California Counties," March 29, 2006.

[58] The estimated impacts to development activities of this analysis differ significantly from the estimated impacts in the 2006 FEA primarily due to the difference in conservation measures specified by the Service. Specifically, habitat preservation ratios used in the 2006 FEA for development activities ranged from 1:1 to 3:1 depending on the following factors: type of impact (permanent or temporary), type of habitat impacted (breeding or non-breeding) and the location of the project (within the jurisdiction of the Sacramento or Ventura field office).

$11,000 per acre.[59] A review of the consultation history for residential and commercial development projects revealed breeding habitat comprises, on average, about five percent of the total affected frog habitat. This analysis applies this ratio to estimate impacts to breeding habitat (five percent) versus dispersal habitat (95 percent).

96. Under the second scenario, the Service may recommend habitat restoration to offset development impacts. The cost of habitat restoration varies significantly depending on the type of habitat as well as the level of restoration required. In fact, preliminary discussions with frog stakeholders indicate that restoration cost for on-site habitat restoration during construction activities can range from $700 per acre to $1,700 per acre. However, the cost of restoring habitat off-site can range from $6,000 to $214,000 per acre.[60] The 2002 Draft Economic Analysis for the San Bernardino kangaroo rat, a species that also requires riparian and upland habitat features, assumed restoration costs of approximately $50,000 per acre based on interviews with several local firms providing restoration services.[61] This analysis applies the assumption that the cost of habitat restoration will be $50,000 per acre.[62]

97. As shown in Exhibit 4-7, the low- and high-end estimates differ depending on the likelihood that the frog will be detected because of differences in the amount of habitat preservation required for areas where the frog is detected (2:1 to 6:1) versus areas where the frog is not detected (1:1).

EXHIBIT 4-7 LOW- AND HIGH-END PROJECT MODIFICATION ESTIMATES BY PROJECT LOCATION

PROJECT LOCATION	LOW	HIGH
Frog Detected Based on CNDDB	Habitat restoration on-site	Habitat preservation off-site 6:1 for permanent impacts and 2:1 for temporary impacts
Frog NOT Detected Based on CNDDB	Habitat preservation off-site 1:1 for permanent and temporary impacts	Habitat restoration on-site

98. Because the exact timing of future development is unknown, this analysis spreads project modification costs evenly across years and over time. Exhibit 4-8 summarizes the project

[59] Personal communication with Westervelt Ecological Services staff, Bay Area and Placer County, December 8, 2008. Several other conservation banks were contacted, but specific prices per acre for California red-legged frog habitat were not readily available.

[60] Personal communication, owner, Braddock & Logan, LLC, February 13, 2009; Personal communication, manager, San Juan Oaks Golf Club, February 10, 2009; Center for Biological Diversity, "Both Frogs and People Can Have Homes - Examples of Successful California Red-Legged Frog Habitat Protection Efforts," Press Release, April 13, 2006; NOAA Restoration Center, San Gregorio Creek Restoration Project; Personal communication, Environmental Defense Fund, January 19, 2009.

[61] Industrial Economics, Inc., "Addendum to the Economic Analysis of Critical Habitat Designation for the San Bernardino Kangaroo Rat," March 2002, pp 11-13.

[62] Additional data and/or information are invited on the cost per acre for restoration of frog habitat. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

modification costs, which are attributed to the baseline or incrementally to critical habitat designation based on whether the project developer would likely detect the frog (i.e., areas within a one-mile buffer of the CNDDB).

EXHIBIT 4-8 DEVELOPMENT PROJECT MODIFICATION COSTS (2009-2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	BASELINE		INCREMENTAL	
	LOW	HIGH	LOW	HIGH
ALA-1A	$2,650,000	$3,880,000	$93,800	$269,000
ALA-1B	$1,720,000	$2,520,000	$908,000	$2,600,000
ALA-2	$7,930,000	$11,600,000	$1,930,000	$5,540,000
BUT-1	$0	$0	$0	$0
CAL-1	$2,600,000	$3,810,000	$1,210,000	$3,460,000
CCS-1	$29,700	$43,500	$80,300	$230,000
CCS-2	$40,400,000	$59,200,000	$2,350,000	$6,720,000
ELD-1	$1,360,000	$1,990,000	$712,000	$2,040,000
LOS-1	$0	$0	$0	$0
MEN-1	$6,840	$10,000	$407,000	$1,170,000
MNT-1	$5,240	$7,690	$0	$0
MNT-2	$1,100,000	$1,610,000	$509,000	$1,460,000
MNT-3	$2,640	$3,870	$2,660	$7,620
MRN-1	$120,000	$176,000	$16,400	$47,100
MRN-2	$11,600	$16,900	$59,400	$170,000
MRN-3	$90,300	$132,000	$31,100	$89,100
NAP-1	$29,000	$42,500	$1,600	$4,600
NEV-1	$550,000	$806,000	$324,000	$929,000
PLA-1	$111,000	$163,000	$0	$0
RIV-1	$409,000	$599,000	$11,000	$31,600
SCZ-1	$10,900,000	$16,000,000	$609,000	$1,750,000
SCZ-2	$7,920,000	$11,600,000	$44,600	$128,000
SLO-1	$1,160,000	$1,700,000	$362,000	$1,040,000
SLO-2	$2,730,000	$4,000,000	$737,000	$2,110,000
SLO-3	$5,220,000	$7,650,000	$1,850,000	$5,310,000
SLO-4	$0	$0	$64,900	$186,000
SNB-1	$85,200	$125,000	$20,000	$57,400
SNB-2	$257	$376	$187	$537
SNB-3	$7,320	$10,700	$61,300	$176,000
SNM-1	$962,000	$1,410,000	$178,000	$509,000
SNM-2	$2,690,000	$3,940,000	$1,130,000	$3,220,000
SOL-1	$1,430,000	$2,090,000	$126,000	$362,000
SOL-2	$267,000	$392,000	$186,000	$533,000

UNIT	BASELINE		INCREMENTAL	
	LOW	HIGH	LOW	HIGH
SOL-3	$1,550,000	$2,270,000	$202,000	$577,000
SON-1	$21,200	$31,100	$0	$0
SON-2	$35,400	$51,900	$14,700	$42,000
SON-3	$398,000	$583,000	$12,800	$36,800
STB-1	$0	$0	$146	$420
STB-2	$641,000	$939,000	$181,000	$519,000
STB-3	$0	$0	$592	$1,700
STB-4	$0	$0	$0	$0
STB-5	$3,630	$5,320	$2,890	$8,280
STB-6	$540,000	$792,000	$73,100	$210,000
STB-7	$1,040	$1,530	$16,500	$47,400
STC-1	$396,000	$580,000	$214,000	$612,000
STC-2	$1,770,000	$2,600,000	$770,000	$2,210,000
VEN-1	$47,300	$69,400	$4,830	$13,800
VEN-2	$0	$0	$0	$0
VEN-3	$0	$0	$86,100	$247,000
YUB-1	$110,000	$161,000	$34,200	$98,000
Total	**$98,000,000**	**$144,000,000**	**$15,600,000**	**$44,800,000**
Note: Totals may not sum due to rounding.				

4.7.3 IMPACTS FROM DEVELOPMENT DELAYS

99. In addition to the administrative costs of consultations and the project modifications necessary to satisfy consultation requirements, the consultation process may also result in the delay of project completion. Based on a review of the consultation history, the average delay due to the consultation process for development projects is approximately nine months.[63]

100. The impact of project delays associated with the consultation process are estimated based on the opportunity costs of not being able to develop for some period of time. The delay cost (an asset holding cost) represents the amount of interest that the value of the asset could have gained during that period. In addition, the consultation process exposes the developer to additional uncertainty about the magnitude and timing of development. The delay cost is calculated by multiplying the value of the land to be developed with the market interest rate and the time period (i.e., nine months).[64] The market interest rate assumed in this analysis is 15 percent, which reflects a rate commonly used by developers

[63] This analysis assumes the time to complete a consultation is the same for consultations that address jeopardy or adverse modification or both. Additional data and/or information are invited on the time required to complete a consultation. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

[64] A detailed explanation of the methodology used to estimate the value of developable land is presented in Appendix E.

to value a risky cash flow. Exhibit 4-9 summarizes the delay costs, which are attributed to the baseline or incrementally to critical habitat designation based on the same logic used to allocate project modification costs.

EXHIBIT 4-9 DEVELOPMENT DELAY COSTS (2009-2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	BASELINE	INCREMENTAL
ALA-1A	$13,600,000	$998,000
ALA-1B	$9,700,000	$11,800,000
ALA-2	$26,400,000	$20,100,000
BUT-1	$0	$0
CAL-1	$838,000	$1,110,000
CCS-1	$66,700	$789,000
CCS-2	$89,300,000	$12,000,000
ELD-1	$1,370,000	$2,050,000
LOS-1	$0	$0
MEN-1	$11,900	$2,020,000
MNT-1	$5,130	$0
MNT-2	$4,730,000	$5,900,000
MNT-3	$5,480	$15,800
MRN-1	$352,000	$138,000
MRN-2	$33,900	$499,000
MRN-3	$243,000	$239,000
NAP-1	$90,200	$13,300
NEV-1	$682,000	$1,150,000
PLA-1	$74,100	$0
RIV-1	$190,000	$14,700
SCZ-1	$23,200,000	$3,670,000
SCZ-2	$16,500,000	$265,000
SLO-1	$1,580,000	$1,370,000
SLO-2	$10,500,000	$8,020,000
SLO-3	$20,100,000	$20,200,000
SLO-4	$0	$706,000
SNB-1	$177,000	$119,000
SNB-2	$533	$1,110
SNB-3	$15,200	$365,000
SNM-1	$4,900,000	$2,860,000
SNM-2	$11,400,000	$13,700,000
SOL-1	$890,000	$230,000
SOL-2	$143,000	$301,000
SOL-3	$904,000	$343,000

UNIT	BASELINE	INCREMENTAL
SON-1	$22,200	$0
SON-2	$32,000	$35,900
SON-3	$369,000	$27,300
STB-1	$0	$1,040
STB-2	$1,810,000	$1,460,000
STB-3	$0	$4,210
STB-4	$0	$0
STB-5	$9,000	$20,500
STB-6	$1,340,000	$520,000
STB-7	$2,590	$118,000
STC-1	$1,780,000	$2,720,000
STC-2	$7,290,000	$9,450,000
VEN-1	$127,000	$37,000
VEN-2	$0	$0
VEN-3	$0	$930,000
YUB-1	$191,000	$170,000
Total	**$251,000,000**	**$126,000,000**
Note: Totals may not sum due to rounding.		

4.8 STEP SIX: ESTIMATE INDIRECT IMPACTS

101. In addition to the costs incurred by private landowners and developers summarized in the previous three sections, private landowners may incur additional costs related to compliance under other State or local laws that would not have been triggered absent critical habitat designation. As discussed in Chapter 2, under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic area, potentially triggering additional economic impacts. In this case, these impacts are considered indirect, incremental impacts of the designation. The following sections consider potential indirect impacts on development from two State laws: CEQA and the CCA.

California Environmental Quality Act

102. CEQA requires proposed projects that have the potential to harm sensitive species or habitat (state- or federally-listed) to identify their environmental effects. CEQA requires State and local agencies ("the lead agency") to determine whether a proposed project would have a "significant" impact on the environment, and for any such impacts identified, determine whether feasible mitigation measures or alternatives will reduce the impact to a "less-than significant" level. Under CEQA, the lead agency typically requires projects that may impact sensitive species or habitat to sponsor a biological assessment by a qualified biologist to determine the potential for impacts to all rare, threatened and endangered species. Section 15065 of Article 5 of CEQA states that a finding of significance is mandatory if the project will:

> "substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

If the lead agency finds that a project causes significant impacts, the project proponent must prepare an EIR. CEQA requirements already play a role in conservation for the red-legged frog by requiring an environmental review for projects that may impact the frog.

103. CEQA is implemented at a local level by county planning departments. Planners from seven counties were contacted and interviewed to determine whether critical habitat designation for the frog influences the way the county implements CEQA. If staff indicated that critical habitat is taken into consideration, they were asked to identify what additional measures would be required of the project proponent to comply with the CEQA review process in proposed critical habitat areas. The end result of the CEQA review process can vary significantly by county. Based on discussions with various counties, described below are the two most common results of the CEQA review process after designation of critical habitat.

- **"Mitigated Negative Declaration" Scenario**. Most county planners indicated that they would rely on the Service's critical habitat decision for the frog when considering proposed development. For development projects without a Federal nexus (20 percent of the time) that fall within critical habitat, county planners would typically require the preparation of an assessment by a qualified biologist detailing any impacts to the frog and its habitat, and any measures recommended to minimize identified impacts.[65] Biological assessments would then be circulated to the Service as well as the California Department of Fish and Game for additional review and/or project modification recommendations. County planners state that in most cases, recommendations result in restoration, mitigation, avoidance, or some combination thereof.[66] By following these guidelines, the proposed development would usually claim a "mitigated negative declaration" as a result of the CEQA review process.[67] If the project cannot be mitigated at this stage of the CEQA process, an EIR must be prepared along with identification of feasible project alternatives or appropriate mitigation measures.[68]

[65] County planners indicated that CEQA regulations would not duplicate conservation measures required as a result of section 7 consultation with the Service. That is, if a Federal nexus exists and the project applicant is required to consult with the Service, the county would not place any additional recommendations on the project beyond those already recommended by the Service.

[66] Personal communication with Paula Bradley, Monterey County Associate Planner, January 8, 2009; John Karamitsos, Santa Barbara County Planner, January 8, 2009; Lissette Knight, San Benito County Associate Planner, January 8, 2009; Bruce Jensen, Alameda County Senior Planner, January 9, 2009; Debbie Foley, Contra Costa County Senior Planning Technician, January 9, 2009.

[67] California Code of Regulations §15070

[68] California Code of Regulations §§15080 to 15097

- **"No Additional Action" Scenario**. In some cases, county planners indicated that although the designation of critical habitat for the frog might be taken into consideration in evaluating whether or not to protect a given area, the entire area of critical habitat would not necessarily be identified as sensitive habitat. For example, in Santa Cruz and San Mateo Counties local county policies or county designations of sensitive areas would trump information from the Service. In this case, the counties would not necessarily require surveys or the employment of qualified biologists if a proposed development fell within critical habitat, but not in an area the county previously identified as an environmentally sensitive habitat.[69]

In order to account for the different approaches counties may take in response to the designation of critical habitat for the frog, a range of impacts are presented. On the low end, counties may not incorporate federally-designated critical habitat into their CEQA review process. In this case, indirect impacts are limited to the additional administrative and delay costs associated with addressing the frog and/or its habitat within the project area. On the high end, county planners may require project modifications for impacts to the frog and/or its habitat associated with development activities. This analysis assumes required conservation measures under CEQA would be similar to conservation measures used by the Service.[70]

104. County planners did indicate, however, that CEQA regulations would not duplicate conservation measures required as a result of section 7 consultation with the Service. That is, if a Federal nexus exists and the project applicant is required to consult with the Service, the county would not place any additional project modifications on the project beyond those already recommended by the Service. However, regardless of whether a Federal nexus exists, presence of the frog and/or its habitat adds an additional layer of administrative and delay costs associated with the CEQA review process. Administrative costs associated with CEQA vary depending on the type of project. Based on discussions with consultants who specialize in CEQA, this analysis uses an average cost for developing CEQA documents of $19,333 per project.[71] The average delay associated with CEQA is approximately two years.[72] This analysis assumes delays for section 7

[69] Personal communication with Paula Bradley, Monterey County Associate Planner, January 8, 2009; Steve Monowitz, San Mateo County Long Range Planning, January 9, 2009.

[70] It is also legally feasible for counties to recommend that development be avoided entirely in critical habitat. This is possible under CEQA, but also under other local regulations. For example, under the Alameda County General Plan, development may be precluded in critical habitat (Personal communication, Planner, Alameda County Planning Department; Alameda County General Plan, East County Area Plan, page 79, accessed at: http://www.acgov.org/cda/planning/plans.htm.) Although it is unlikely that development would be precluded throughout the range of frog critical habitat, it is difficult to determine the extent to which complete avoidance would be recommended. The economic impact of such a policy, however, would be substantial.

[71] Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the La Grosia Thistle," prepared for the U.S. Fish and Wildlife Service, November 2008.

[72] Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the La Grosia Thistle," prepared for the U.S. Fish and Wildlife Service, November 2008.

consultation and CEQA are sequential; in other words consultation with the Service adds to CEQA delays.[73]

105. Exhibit 4-10 summarizes the types of indirect, incremental impacts associated with the CEQA review as a result of critical habitat designation. Exhibits 4-11 and 4-12 summarize the indirect costs associated with CEQA where a Federal nexus exists (80 percent of the time) and where a Federal nexus does not exist (20 percent of the time), respectively. Indirect costs are attributed to the baseline or incrementally to critical habitat designation based on the same logic used for direct impacts.

EXHIBIT 4-10 TYPES OF INDIRECT IMPACTS ASSOCIATED WITH CEQA

PROJECT LOCATION	FEDERAL NEXUS (80 PERCENT OF THE TIME)	NO FEDERAL NEXUS (20 PERCENT OF THE TIME)
Frog Detected Based on CNDDB	✓ Delay ✓ Administrative Costs	✓ Delay ✓ Administrative Costs ✓ Project Modifications ranging from none to conservation measures similar to those required by the Service.
Frog NOT Detected Based on CNDDB	✓ Delay ✓ Administrative Costs	✓ Delay ✓ Administrative Costs ✓ Project Modifications ranging from none to conservation measures similar to those required by the Service.

[73] A delay of two years associated with CEQA, sequential to section 7 consultation, is a reasonable assumption according to developers in San Benito County. (Personal communication, General Manager, San Juan Oaks Golf Club, February 10, 2009; Personal communication, Owner, Braddock & Logan Homes, February 13, 2009.) Although this analysis assumes that development activities within the study area will be delayed by two years to comply with CEQA at the County level, in many cases this delay time may be attributable to other environmental and/or community concerns unrelated to the frog (e.g., transportation or air quality impacts). Therefore, the indirect impacts from delay presented in the analysis represent an upper bound estimate of potential impacts. Additional data and/or information are invited on the time required to complete CEQA review within the study area. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

EXHIBIT 4-11 INDIRECT COSTS ASSOCIATED WITH CEQA: WITH A FEDERAL NEXUS (2009-2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	BASELINE	INCREMENTAL
ALA-1A	$36,200,000	$2,660,000
ALA-1B	$25,900,000	$31,300,000
ALA-2	$70,400,000	$53,600,000
BUT-1	$0	$0
CAL-1	$2,240,000	$2,980,000
CCS-1	$178,000	$2,110,000
CCS-2	$238,000,000	$32,000,000
ELD-1	$3,660,000	$5,490,000
LOS-1	$0	$0
MEN-1	$31,600	$5,390,000
MNT-1	$13,700	$0
MNT-2	$12,600,000	$15,700,000
MNT-3	$14,600	$42,200
MRN-1	$940,000	$368,000
MRN-2	$90,400	$1,330,000
MRN-3	$648,000	$639,000
NAP-1	$241,000	$35,600
NEV-1	$1,820,000	$3,080,000
PLA-1	$198,000	$0
RIV-1	$509,000	$39,400
SCZ-1	$62,000,000	$9,790,000
SCZ-2	$43,900,000	$708,000
SLO-1	$4,220,000	$3,660,000
SLO-2	$28,000,000	$21,400,000
SLO-3	$53,600,000	$53,800,000
SLO-4	$0	$1,880,000
SNB-1	$472,000	$318,000
SNB-2	$1,420	$2,970
SNB-3	$40,500	$974,000
SNM-1	$13,100,000	$7,620,000
SNM-2	$30,400,000	$36,600,000
SOL-1	$2,380,000	$614,000
SOL-2	$381,000	$804,000
SOL-3	$2,420,000	$918,000
SON-1	$59,300	$0
SON-2	$85,600	$96,000
SON-3	$985,000	$72,900
STB-1	$0	$2,780

UNIT	BASELINE	INCREMENTAL
STB-2	$4,830,000	$3,880,000
STB-3	$0	$11,200
STB-4	$0	$0
STB-5	$24,000	$54,800
STB-6	$3,580,000	$1,390,000
STB-7	$6,900	$314,000
STC-1	$4,750,000	$7,270,000
STC-2	$19,400,000	$25,200,000
VEN-1	$338,000	$98,800
VEN-2	$0	$0
VEN-3	$0	$2,480,000
YUB-1	$509,000	$453,000
Total	**$669,000,000**	**$337,000,000**
Note: Totals may not sum due to rounding.		

EXHIBIT 4-12 INDIRECT COSTS ASSOCIATED WITH CEQA: WITHOUT A FEDERAL NEXUS (2009-2030, 2008 DOLLARS, SEVEN PERCENT DISCOUNT RATE)

UNIT	BASELINE		INCREMENTAL	
	LOW	HIGH	LOW	HIGH
ALA-1A	$9,050,000	$10,000,000	$666,000	$689,000
ALA-1B	$6,470,000	$7,100,000	$7,840,000	$8,060,000
ALA-2	$17,600,000	$20,500,000	$13,400,000	$13,900,000
BUT-1	$0	$0	$0	$0
CAL-1	$561,000	$1,510,000	$746,000	$1,050,000
CCS-1	$44,500	$55,400	$526,000	$547,000
CCS-2	$59,600,000	$74,400,000	$8,000,000	$8,590,000
ELD-1	$914,000	$1,410,000	$1,370,000	$1,550,000
LOS-1	$0	$0	$0	$0
MEN-1	$7,910	$10,400	$1,350,000	$1,450,000
MNT-1	$3,420	$5,350	$0	$0
MNT-2	$3,160,000	$3,560,000	$3,940,000	$4,060,000
MNT-3	$3,650	$4,620	$10,600	$11,200
MRN-1	$235,000	$279,000	$92,100	$96,200
MRN-2	$22,600	$26,800	$333,000	$348,000
MRN-3	$162,000	$195,000	$160,000	$167,000
NAP-1	$60,200	$70,800	$8,900	$9,300
NEV-1	$455,000	$657,000	$769,000	$850,000
PLA-1	$49,500	$90,300	$0	$0
RIV-1	$127,000	$277,000	$9,850	$12,600
SCZ-1	$15,500,000	$19,500,000	$2,450,000	$2,600,000
SCZ-2	$11,000,000	$13,900,000	$177,000	$188,000
SLO-1	$1,060,000	$1,480,000	$915,000	$1,010,000
SLO-2	$6,990,000	$7,990,000	$5,350,000	$5,530,000
SLO-3	$13,400,000	$15,300,000	$13,400,000	$13,900,000
SLO-4	$0	$0	$471,000	$487,000
SNB-1	$118,000	$149,000	$79,500	$84,500
SNB-2	$356	$450	$743	$790
SNB-3	$10,100	$12,800	$243,000	$259,000
SNM-1	$3,270,000	$3,620,000	$1,910,000	$1,950,000
SNM-2	$7,590,000	$8,570,000	$9,150,000	$9,430,000
SOL-1	$594,000	$1,120,000	$153,000	$185,000
SOL-2	$95,300	$193,000	$201,000	$247,000
SOL-3	$604,000	$1,170,000	$230,000	$280,000
SON-1	$14,800	$22,600	$0	$0
SON-2	$21,400	$34,400	$24,000	$27,700

UNIT	BASELINE		INCREMENTAL	
	LOW	HIGH	LOW	HIGH
SON-3	$246,000	$392,000	$18,200	$21,400
STB-1	$0	$0	$695	$731
STB-2	$1,210,000	$1,440,000	$971,000	$1,020,000
STB-3	$0	$0	$2,810	$2,960
STB-4	$0	$0	$0	$0
STB-5	$6,000	$7,330	$13,700	$14,400
STB-6	$894,000	$1,090,000	$347,000	$365,000
STB-7	$1,720	$2,110	$78,400	$82,500
STC-1	$1,190,000	$1,330,000	$1,820,000	$1,870,000
STC-2	$4,860,000	$5,510,000	$6,300,000	$6,490,000
VEN-1	$84,600	$102,000	$24,700	$25,900
VEN-2	$0	$0	$0	$0
VEN-3	$0	$0	$620,000	$642,000
YUB-1	$127,000	$167,000	$113,000	$122,000
Total	**$167,000,000**	**$203,000,000**	**$84,300,000**	**$88,200,000**
Note: Totals may not sum due to rounding.				

California Coastal Act

106. The California Coastal Commission can restrict development in ESHAs under the CCA. The California Public Resources Code states,

> "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas."[74]

The Coastal Commission determines whether or not an area is an environmentally sensitive habitat area based on its own surveys and reports; determination of an environmentally sensitive habitat area is typically not influenced by the designation of critical habitat.[75]

107. Although the Coastal Commission is clearly allowed by law to preclude development in ESHAs, it is possible for the Coastal Commission to approve of development in an ESHA. In the past, the Coastal Commission has approved development in ESHAs conditional on adoption of certain mitigation measures. For example, in 2003, the Coastal Commission approved construction of a hospital addition with certain special conditions of approval. The project, undertaken by the Community Hospital of the Monterey Peninsula, was located within an ESHA near critical habitat unit MNT-2.[76]

[74] California Public Resources Code, Article 5. Land Resources, §30240.

[75] Personal communication with Coastal Planner, California Coastal Commission, September 7, 2007.

[76] Personal communication with the California Coastal Commission, December 10, 2003.

108. It is difficult to accurately quantify the potential impacts to development within the jurisdiction of the Coastal Commission due to the uncertainty regarding whether or not the Coastal Commission will approve future development projects. Furthermore, the costs associated with compliance with the CCA are not directly related to critical habitat designation for the frog. Accordingly, this analysis does not quantify potential indirect impacts associated with the CCA.

4.9 SOURCES OF UNCERTAINTY

109. It is important to recognize the uncertainty inherent in the assumptions underlying this analysis. Exhibit 4-13 summarizes these uncertainties and their potential effect on estimated economic impacts.

EXHIBIT 4-13 SUMMARY OF UNCERTAINTIES TO URBAN DEVELOPMENT ANALYSIS

ASSUMPTION	POTENTIAL EFFECT ON RESULTS
In areas without any reported frog sightings in the CNDDB, the Service typically requires focused field surveys as well as site-specific assessments of suitable habitat and habitat connectivity. Ideally, this analysis would rely on data about the frequency that these additional site assessment activities result in the detection of the frog. However, according to discussions with the Service, these data are not tracked. Accordingly, this analysis conservatively assumes that frogs will not likely be detected in these areas. To the extent that this approach under-estimates the likelihood that frogs will be detected in a proposed critical habitat unit, baseline impacts will be understated and incremental impacts will be overstated.	+/-
The application of different discount rates to estimate present value and annualized costs reveals another key source of uncertainty in the analysis, as impacts applying a seven percent discount rate are roughly 70 percent of the value of impacts calculated using a three percent discount rate. The cost of development delays drives the overall impact estimates. Delay costs are dependent on raw land values, which are estimated by combining information about the value of land and the timing of future development. Consideration of timing relies on the social discount rates applied throughout this analysis (three and seven percent), rather than developers' opportunity cost of capital, which is likely much higher. As a result, raw land values, and therefore delay costs, are likely overstated under both discount rate assumptions.	+
The analysis uses the best readily available GIS information to calculate the acreage of developable land. These estimates may over- or understate the actual lands available for development. For example, the estimated acreage of developable lands may be overstated because some small parcels of privately owned lands may be unavailable for development. Because the ownership data for this analysis covers such a large area of California, details on small-scale protected lands may have been overlooked.	+/-

ASSUMPTION	POTENTIAL EFFECT ON RESULTS
The analysis relies on projections of future development activity provided by ABAG, AMBAG, SACOG, SLOCOG, SBCAG, and AGS and allocates the development spatially using BEC's model. These data sources represent the best currently available information. However, if future development activity is significantly different from these projections or occurs in significantly different locations, impacts may be over- or understated.	+/-
Development activity is assumed to occur at a constant rate over the time period of the analysis. If projects occur more frequently in earlier periods, costs will be understated. Conversely, if development activity is more likely in later periods, impacts will be overstated.	+/-
The assumption that impacts to all developable lands within critical habitat can be offset by provision of conservation lands may not be true for all areas. Some developable lands may be too crucial for frog conservation and recovery, and may not be considered replaceable. In other cases, local planning authorities may recommend more stringent conservation measures (such as complete avoidance) as a result of the presence of the frog and/or its habitat. To the extent, that more stringent conservations measures are enforced, this analysis may be understated.	-
The ratio between breeding and dispersal habitat applied in this analysis (5 percent and 95 percent, respectively) may be an under- or overestimate of the true ratio between breeding and dispersal habitat within the study area.	+/-
This analysis assumes habitat restoration costs of approximately $50,000 per acre. As discussed above, site-specific habitat restoration varies significantly depending on the type of habitat and the level of required restoration. To the extent that habitat restoration costs differ, impacts may be over- or understated.	+/-
This analysis applies price per acre at local land conservation banks for $11,000 per acre for dispersal habitat and $140,000 per acre for breeding habitat. To the extent that these prices change over time, impacts may be over- or understated.	+/-
This analysis assumes projects delays associated with section 7 consultation and the CEQA process of nine months and two years, respectively. Furthermore, this analysis assumes delays for section 7 consultation and CEQA are sequential; in other words consultation with the Service adds to CEQA delays. To the extent that actual delays time periods differ than these assumptions, impacts may be over- or understated.	+/-
+: This assumption may result in an overestimate of real costs. -: This assumption may result in an understatement of real costs. +/-: The assumption has an unknown effect on estimates.	

CHAPTER 5 | WATER MANAGEMENT

110. This section describes how conservation efforts to protect the frog and its habitat may affect water management activities in the study area. Local water management districts, flood control districts, and public works departments are responsible for maintaining waterways and channels for flood control and water supply projects. According to the final rule listing the species as threatened, flood control maintenance activities, such as vegetation removal, channel maintenance, herbicide spraying, shaping of banks to control erosion and desilting of creeks may degrade frog habitat.[77]

111. Exhibit 5-1 provides an overall summary of impacts to water management activities as described in the remainder of the chapter. Based on a review of the consultation history, frog-specific conservation measures required for water management-related activities are primarily designed to reduce potential impacts to the frog in the project area during project activities. None of the conservation measures recommended by the Service in past consultations for projects located within or outside of designated critical habitat are specifically designed to address adverse modification. Accordingly, conservation measures for water management-related activities are expected to occur even in the absence of critical habitat designation and are attributed to the baseline.

5.1 BACKGROUND

112. Since critical habitat for the species was designated in 2001, there has been an average of eight section 7 consultations associated with water management activities per year. Conservation measures required for water management-related activities are primarily designed to protect the frog while project activity is underway. Conservation measures for water management-related activities include:

- Pre-construction survey, capture and removal of any frogs by qualified biologists;
- Pre-construction education of site workers by qualified biologists;
- Daily supervision of project activities by a qualified biologist;
- Construction confined to the dry season; and
- Installation of temporary silt fences to minimize sedimentation.[78]

[77] 73 FR 53492.

[78] Water management agencies and flood control districts schedule the majority of their projects in the dry season and impacts associated with seasonal restrictions can typically be mitigated with advanced planning, resulting in negligible impacts.

Based on discussions with local water management agencies, the average cost of implementing the conservation measures for water management-related activities is approximately $25,000 per project.[79]

113. In addition to the above frog-specific conservation measures, the Service may also require additional conservation measures designed to preserve water quality (e.g., prepare a spill prevention and clean up plan), and minimize sedimentation and stream bank erosion during construction activities. The majority of these conservation measures are likely to occur even in the absence of the frog and its habitat as part of best management practices followed by local water management agencies. Accordingly, no incremental impacts are anticipated, regardless of whether the project occurs in areas of critical habitat where no frogs are present (i.e., outside of the CNDDB footprint within the study area). Exhibit 5-1 forecasts baseline impacts to water management activities by critical habitat unit during the post-designation period from 2009 to 2030. Costs quantified include conservation measures required for water management-related activities and the administrative costs of section 7 consultation. The cost of implementing best management practices not specifically related to the frog is not included in this analysis.

EXHIBIT 5-1 POST-DESIGNATION BASELINE ECONOMIC IMPACTS TO WATER MANAGEMENT (2009-2030, 2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE COST
ALA-1A	$15,000
ALA-1B	$58,300
ALA-2	$129,000
BUT-1	$40,700
CAL-1	$27,100
CCS-1	$74,700
CCS-2	$229,000
ELD-1	$40,700
LOS-1	$27,100
MEN-1	$54,300
MNT-1	$27,400
MNT-2	$135,000
MNT-3	$66,700
MRN-1	$13,600
MRN-2	$27,100
MRN-3	$54,300
NAP-1	$13,600
NEV-1	$54,300
PLA-1	$47,900

[79] Per project cost estimates include the costs of frog surveying and monitoring and erecting silt fencing. Cost information was obtained from the following sources: Rich Boyer, Water Resources Engineer, Monterey County Water Resources Agency on January 6, 2009; Chris Berry, Water Resource Manager, Santa Cruz City Water Department; and Maureen Spencer, Environmental Services Manager, Santa Barbara County Flood Control District on December 9, 2008.

UNIT	PRESENT VALUE COST
RIV-1	$40,700
SCZ-1	$111,000
SCZ-2	$43,200
SLO-1	$31,200
SLO-2	$72,900
SLO-3	$115,000
SLO-4	$50,200
SNB-1	$45,600
SNB-2	$15,900
SNB-3	$49,300
SNM-1	$104,000
SNM-2	$132,000
SOL-1	$13,600
SOL-2	$13,600
SOL-3	$27,100
SON-1	$27,100
SON-2	$13,600
SON-3	$27,100
STB-1	$34,400
STB-2	$37,500
STB-3	$54,400
STB-4	$29,700
STB-5	$44,400
STB-6	$44,200
STB-7	$110,000
STC-1	$61,200
STC-2	$102,000
VEN-1	$17,700
VEN-2	$34,500
VEN-3	$61,300
YUB-1	$27,100
Total	**$2,730,000**

5.2 SOURCES OF UNCERTAINTY

114. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data. To the extent that the past rate of consultation is not a good predictor of future water management project activity in the study area, impacts may be over- or understated. Furthermore, based on history and the specific characterization of the threat associated with water management activities (i.e., focus on flood control maintenance activities), this analysis assumes that management decisions regarding flow levels will not be affected by the presence of the frog or its critical habitat.

CHAPTER 6 | AGRICULTURAL CROP FARMING

115. This chapter considers potential economic impacts to agricultural crop farming activities resulting from frog conservation efforts. Agricultural pollution can result in direct toxic effects to frog or its prey base, and can also result in contamination of water with fertilizers and pesticides.[80]

116. This chapter begins with an overall summary of impacts to agricultural crop farming activities. Next, past and likely future agricultural crop farming activities within the study area are discussed, followed by the presentation of pre- and post-designation impacts. Exhibit 6-1 summarizes pre- and post-designation impacts to agricultural activities. Exhibit 6-2 presents the top ten units ranked by incremental impacts. As shown, impacts in these top ten units account for approximately 75 percent of total impacts.

EXHIBIT 6-1 SUMMARY OF IMPACTS TO AGRICULTURAL CROP FARMING ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

VALUES	LOW	HIGH
Pre-Designation Impacts (1996 - 2008)		
Present Value of Impacts	$144,000,000	$148,000,000
Post-Designation Baseline Impacts (2009 - 2030)		
Present Value of Impacts	$456,000,000	$464,000,000
Annualized Impact Value	$41,300,000	$41,900,000
Incremental Impacts (2009 - 2030)		
Present Value of Impacts	$156,000,000	$169,000,000
Annualized Impact Value	$14,100,000	$15,300,000

[80] 2002 Recovery Plan.

EXHIBIT 6-2 TOP TEN UNITS RANKED BY INCREMENTAL IMPACTS (PRESENT VALUE 2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNIT NAME	LOW	PERCENTAGE OF IMPACTS	HIGH	PERCENTAGE OF IMPACTS
MRN-2	Salmon Creek	$34,100,000	21.9%	$36,100,000	21.4%
SNM-2	Pescadero	$14,200,000	9.1%	$15,300,000	9.1%
SCZ-1	North Coastal Santa Cruz County	$14,200,000	9.1%	$15,200,000	9.0%
SLO-2	Piedras Blancas to Cayucos Creek	$12,300,000	7.9%	$12,600,000	7.5%
SLO-3	Willow and Toro Creeks to San Luis Obispo	$12,100,000	7.8%	$12,500,000	7.4%
STC-2	Wilson Peak	$9,740,000	6.2%	$11,100,000	6.6%
CCS-2	Mount Diablo	$7,960,000	5.1%	$8,300,000	4.9%
MRN-1	Estero	$6,050,000	3.9%	$6,540,000	3.9%
STC-1	Cañada de Pala	$4,670,000	3.0%	$4,920,000	2.9%
SOL-2	Jameson Canyon	$4,690,000	3.0%	$4,890,000	2.9%
	% of Total Impacts		**77%**		**75%**

6.1 AGRICULTURAL CROP FARMING ACTIVITIES IN THE STUDY AREA

117. Under section 7, the U.S. Environmental Protection Agency (EPA) must consult with the Service to ensure that registration of products under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) complies with the Act. On April 2, 2002, the Center for Biological Diversity filed a lawsuit in Federal District Court for the Northern District of California, alleging that EPA failed to comply with section 7 by not ensuring that its registration of 66 named pesticide active ingredients will not result in adverse affects to the frog. On October 20, 2006, the U.S. District Court for the Northern District of California issued a Stipulated Injunction requiring EPA to determine the effects of 66 pesticide active ingredients on the frog within identified areas of California under a court-ordered schedule of three years.[81] In addition, the court's injunction disallowed the use of the 66 named pesticide active ingredients within three identified areas:[82]

1. **Final Critical Habitat**, specified as all areas identified as frog habitat in the Service's 2006 critical habitat designation;
2. **Frog Populations Outside Final Critical Habitat** based on frog occurrence data contained in the California Department of Fish and Game's CNDDB; and [83]

[81] Stipulated Injunction available at: http://www.epa.gov/espp/litstatus/stipulated-injunction.pdf.

[82] Some pesticide uses are exempt from the court's injunction, or have exceptions to the court's injunction. For more information, see Step 3 – Exceptions to the Injunction at: http://www.epa.gov/espp/litstatus/redleg-frog/steps-info.htm

[83] Includes areas identified under section 4(b) "California Red-Legged Frog Populations Outside Final Critical Habitat."

3. **Buffer Areas**. For aerial applications, pesticides cannot be applied within 200 feet from the edge of frog habitat; and for ground applications, the buffer zone is 60 feet.

This analysis assumes that the proposed revision of critical habitat will alter and expand the existing geographic areas subject to the Stipulated Injunction.

118. Another potential Federal nexus for section 7 consultation associated with agricultural crop farming activities is voluntary funding, or cost-sharing, from the Natural Resources Conservation Service (NRCS). Because there have been no consultations on NRCS-funded agricultural crop farming projects in the past in the study area, it is difficult to project the number of similar activities likely in the future.[84]

6.2 METHODS AND ASSUMPTIONS

119. To identify and estimate impacts to agricultural crop farming activities from the establishment of no pesticide use areas, this analysis employs a three-step process:

1. **Identify active farming land within the study area** based on spatial data from the California Department of Conservation's FMMP. As shown in Exhibit 6-3, farming is actively occurring in 39 critical habitat units, on approximately 85,800 acres.

   As previously discussed, the court imposed two types of buffer areas on pesticide application depending on the type of application: 200 feet for aerial applications and 60 feet for ground applications. Data are unavailable on the proportion of land within the study area for which aerial applications is used versus ground applications. Accordingly, this analysis bounds impacts to agricultural activities based on these two buffer areas.

   - At the lower bound, the analysis assumes that all areas use ground pesticide application and applies a buffer area of 60 feet to the study area.
   - At the upper bound, the analysis assumes that all areas use aerial pesticide application and applies a buffer area of 200 feet to the study area.

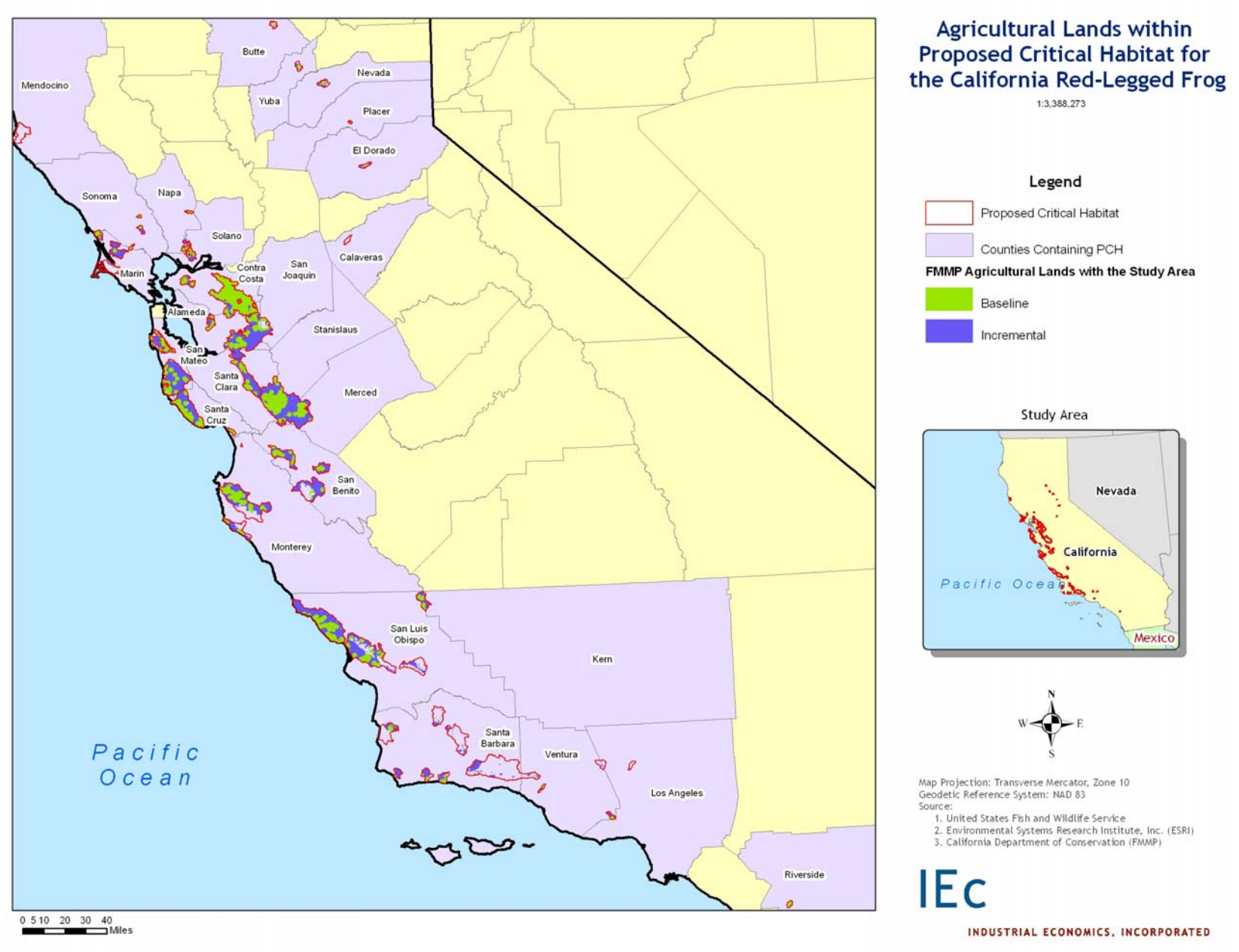
2. **Distinguish between actions resulting from the baseline regulations and the proposed critical habitat rule.** To distinguish between baseline and incremental impacts, this analysis uses the CNDDB to identify areas where the frog would be detected and therefore the injunction will apply regardless of the re-designation of critical habitat. This analysis assumes that implementation of the injunction in areas outside of the CNDDB footprint are incremental impacts because a decision by the Service not to designate those areas will mean the injunction does not apply. Exhibit 6-4 depicts agricultural lands in the study area, including areas where impacts are identified as baseline versus incremental.

[84] Additional data and/or information are invited on future NRCS projects and the potential economic impacts due to frog conservation. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

EXHIBIT 6-3 AGRICULTURAL CROP FARMING LANDS IN PROPOSED REVISED CRITICAL HABITAT BY UNIT

UNIT	SUBUNIT NAME	TOTAL ACRES
ALA-2	Arroyo Valle	424
CCS-1	Berkeley Hillsc	305
CCS-2	Mount Diablo	25,244
ELD-1	Spivey Pond	274
MNT-2	Carmel River	721
MNT-3	Big Sur Coast	233
MRN-1	Estero	5,053
MRN-2	Salmon Creek	7,106
MRN-3	Point Reyes Peninsula	2,426
NAP-1	Wragg Creek	83
NEV-1	Sailor Flat	234
RIV-1	Cole Creek	520
SCZ-1	North Coastal Santa Cruz County	2,513
SCZ-2	Watsonville Slough	1,456
SLO-1	Cholame	1,634
SLO-2	Piedras Blancas to Cayucos Creek	13,897
SLO-3	Willow and Toro Creeks to San Luis Obispo	11,618
SLO-4	Upper Salinas River	480
SNB-1	Hollister Hills/San Benito River	2,097
SNB-2	Antelope Creek/Upper Tres Pinos Creek	37
SNB-3	Pinnacles National Monument	909
SNM-1	Cahill Ridge	348
SNM-2	Pescadero	2,313
SOL-1	Sky Valley	16
SOL-2	Jameson Canyon	167
SOL-3	American Canyon	226
SON-1	Annandel	68
SON-2	Sonoma Mountain	1
SON-3	Petaluma	688
STB-2	San Antonio Terrace	900
STB-3	Sisquoc River	24
STB-5	Gaviota Creek	124
STB-6	Arroyo Quemado to Refugio Creek	936
STB-7	Upper Santa Ynez River and Matilija Creek	426
STC-1	Cañada de Pala	774
STC-2	Wilson Peak	808
VEN-1	San Antonio Creek	548
VEN-3	Upper Las Virgenes Canyon	214
	Total	**85,842**

EXHIBIT 6-4 AGRICULTURAL CROP FARMING LANDS IN PROPOSED REVISED CRITICAL HABITAT



3. **Estimate impacts resulting from the implementation of no pesticide-use areas**. Three types of impacts are estimated:

   - **Pesticide Effects Determination Costs**. As previously discussed, under the stipulated injunction EPA is required to prepare effects determination for the 66 named pesticide active ingredients within three years. According to discussions with EPA staff, each pesticide assessment requires approximately 0.7 FTE at an average salary rate of GS Level 13, plus an additional $10,000 per assessment in data search fees. EPA completed 20 assessments in 2007, 21 in 2008 and expects to complete the final 25 in 2009.[85]

   - **Administrative Costs of Consultation**. The administrative costs of initiating section 7 consultation on the 66 pesticide active ingredients as required under the stipulated injunction are based on the consultation cost model presented in Chapter 2. According to discussions with EPA staff, while pesticide effects determinations for 41 pesticides have been submitted to the Service, section 7 consultation with the Service has not yet begun and is expected to over the next few years.[86]

   - **Project Modification Costs**. This analysis assumes that implementation of no-pesticide use areas will effectively result in the loss of productive agricultural production in affected areas.[87,88] To estimate the value of foregone agricultural production, this analysis relies on county-specific data the USDA National Agriculture Statistics Service (NASS), Census of Agriculture. Specifically, this analysis uses data regarding the acres of cropland per farm and net operational dollar gain (ignoring government payments) per farm. Dividing the latter by the former produces an estimate of the average net operational dollar gain per acre per year, by county (Exhibit 6-5).

[85] Personal communication with Arty Williams, EPA, January 13, 2009.

[86] Ibid.

[87] Personal communication with Polo Moreno, California Department of Pesticide Regulation, December 31, 2008.

[88] To the extent that there are alternative beneficial uses of agricultural land (e.g., organic farming or grazing), this analysis may overstate future economic impacts. A summary of caveats to this analysis is presented in Exhibit 6-9.

EXHIBIT 6-5 ESTIMATED IMPACTS PER ACRE PER YEAR BY COUNTY (2008$)

COUNTY	AVERAGE ACRES OF CROPLAND PER FARM	AVERAGE NET OPERATIONAL DOLLAR GAIN PER FARM	AVERAGE NET OPERATIONAL DOLLAR GAIN PER ACRE OF CROPLAND
Santa Cruz	45	$172,106	$3,851
Napa	56	$142,154	$2,523
Santa Clara	41	$88,879	$2,153
Monterey	380	$782,416	$2,062
Ventura	60	$122,181	$2,044
San Mateo	80	$146,016	$1,836
San Barbara	134	$129,219	$967
Riverside	134	$77,784	$582
San Joaquin	164	$78,865	$481
Contra Costa	106	$49,451	$465
Alameda	138	$53,633	$388
San Benito	170	$60,727	$358
Merced	236	$82,728	$350
San Luis Obispo	154	$28,989	$188
Solano	302	$34,977	$116
California State	**178**	**$87,956**	**$494**

Note: Values adjusted using the GDP Deflator, Budget of the United States Government, Third Quarter 2008, Historical Tables.
Sources: Department of Commerce, Bureau of Economic Analysis, 2004; USDA, National Agricultural Statistics Service. 2002 Census of Agriculture.

6.3 PRE-DESIGNATION IMPACTS

120. The pre-designation period for this analysis begins in 2007, the year following the effective date of the stipulated injunction (October 20, 2006), and continues to 2008. Exhibit 6-6 presents total undiscounted and present value costs of pre-designation frog conservation on agricultural crop farming activities by unit.

EXHIBIT 6-6 AGRICULTURAL CROP FARMING PRE-DESIGNATION ECONOMIC IMPACTS (2007-2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST	
	LOW	HIGH	LOW	HIGH
ALA-2	$276,000	$381,000	$277,000	$383,000
CCS-1	$157,000	$215,000	$158,000	$216,000
CCS-2	$12,800,000	$14,600,000	$12,900,000	$14,700,000
ELD-1	$182,000	$293,000	$183,000	$294,000
MNT-1	$0	$0	$0	$0
MNT-2	$1,650,000	$2,510,000	$1,650,000	$2,510,000
MNT-3	$572,000	$718,000	$573,000	$719,000
MRN-1	$2,430,000	$2,790,000	$2,450,000	$2,800,000
MRN-2	$4,600,000	$5,760,000	$4,630,000	$5,790,000
MRN-3	$1,080,000	$1,310,000	$1,090,000	$1,310,000
NAP-1	$299,000	$495,000	$299,000	$496,000
NEV-1	$734,000	$1,060,000	$735,000	$1,060,000
RIV-1	$405,000	$519,000	$408,000	$521,000
SCZ-1	$8,940,000	$12,000,000	$8,950,000	$12,000,000
SCZ-2	$6,710,000	$8,760,000	$6,710,000	$8,770,000
SLO-1	$573,000	$767,000	$580,000	$775,000
SLO-2	$2,840,000	$3,650,000	$2,870,000	$3,680,000
SLO-3	$2,020,000	$2,520,000	$2,040,000	$2,550,000
SLO-4	$75,900	$118,000	$76,900	$120,000
SNB-1	$775,000	$957,000	$781,000	$963,000
SNB-2	$21,400	$30,800	$21,600	$31,000
SNB-3	$22,400	$46,500	$22,600	$46,800
SNM-1	$700,000	$1,290,000	$701,000	$1,290,000
SNM-2	$3,940,000	$5,820,000	$3,950,000	$5,830,000
SOL-1	$3,500	$5,470	$3,560	$5,540
SOL-2	$669	$2,050	$680	$2,080
SOL-3	$659,000	$1,020,000	$660,000	$1,020,000
SON-1	$19,100	$27,500	$19,500	$27,800
SON-2	$410	$1,380	$417	$1,400
SON-3	$341,000	$382,000	$344,000	$384,000
STB-2	$640,000	$870,000	$642,000	$872,000
STB-3	$33,500	$52,200	$33,700	$52,400
STB-5	$174,000	$267,000	$175,000	$267,000
STB-6	$855,000	$1,190,000	$858,000	$1,190,000
STB-7	$222,000	$289,000	$222,000	$290,000
STC-1	$1,730,000	$2,280,000	$1,730,000	$2,290,000
STC-2	$1,110,000	$1,580,000	$1,120,000	$1,580,000
VEN-1	$1,510,000	$2,250,000	$1,510,000	$2,250,000
VEN-3	$420,000	$633,000	$420,000	$634,000
Total			**$59,800,000**	**$77,700,000**

Note: Totals may not sum due to rounding.

6.4 POST-DESIGNATION IMPACTS

121. The post-designation period for this analysis is 2009 to 2030. Post-designation impacts are categorized as either occurring in the baseline or as incremental to the proposed critical habitat designation. During the post-designation time period, this analysis assumes that the pesticide use restrictions established by the stipulated injunction would continue to provide sufficient protection for the frog. Furthermore, this analysis assumes that the proposed revision of critical habitat will alter and expand the existing geographic areas subject to the Stipulated Injunction. Exhibit 6-7 summarizes the post-designation baseline impacts and Exhibit 6-8 summarizes the incremental impacts to agricultural crop farming activities. Post-designation baseline and incremental impacts by census tract are presented in Appendix B.

EXHIBIT 6-7 AGRICULTURAL CROP FARMING POST-DESIGNATION BASELINE ECONOMIC IMPACTS (2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST*		PRESENT VALUE COST		ANNUALIZED	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-2	$4,270,000	$4,490,000	$2,170,000	$2,280,000	$196,000	$207,000
CCS-1	$9,270,000	$2,110,000	$4,670,000	$1,070,000	$422,000	$96,500
CCS-2	$247,000,000	$251,000,000	$125,000,000	$127,000,000	$11,300,000	$11,500,000
ELD-1	$521,000	$556,000	$264,000	$282,000	$23,900	$25,500
MNT-1	$0	$109,000	$0	$54,700	$0	$4,950
MNT-2	$23,700,000	$23,600,000	$12,000,000	$11,900,000	$1,080,000	$1,080,000
MNT-3	$10,600,000	$10,600,000	$5,330,000	$5,330,000	$482,000	$482,000
MRN-1	$40,500,000	$40,800,000	$20,500,000	$20,600,000	$1,850,000	$1,870,000
MRN-2	$6,640,000	$6,310,000	$3,360,000	$3,200,000	$304,000	$289,000
MRN-3	$1,630,000	$1,900,000	$830,000	$967,000	$75,000	$87,400
NAP-1	$4,930,000	$5,750,000	$2,480,000	$2,900,000	$224,000	$262,000
NEV-1	$4,650,000	$4,410,000	$2,340,000	$2,220,000	$212,000	$201,000
RIV-1	$6,830,000	$7,020,000	$3,450,000	$3,550,000	$312,000	$321,000
SCZ-1	$161,000,000	$160,000,000	$80,900,000	$80,800,000	$7,310,000	$7,300,000
SCZ-2	$123,000,000	$127,000,000	$61,700,000	$63,700,000	$5,570,000	$5,750,000
SLO-1	$4,160,000	$4,060,000	$2,130,000	$2,070,000	$192,000	$187,000
SLO-2	$33,800,000	$33,200,000	$17,300,000	$17,000,000	$1,560,000	$1,540,000
SLO-3	$24,800,000	$24,500,000	$12,700,000	$12,500,000	$1,150,000	$1,130,000
SLO-4	$11,100	$11,100	$9,750	$9,750	$881	$881
SNB-1	$11,100,000	$11,300,000	$5,620,000	$5,720,000	$508,000	$517,000
SNB-2	$300,000	$299,000	$154,000	$154,000	$13,900	$13,900
SNB-3	$128,000	$99,500	$72,700	$58,300	$6,570	$5,270
SNM-1	$9,670,000	$10,300,000	$4,870,000	$5,180,000	$440,000	$469,000
SNM-2	$66,500,000	$70,600,000	$33,500,000	$35,500,000	$3,030,000	$3,210,000
SOL-1	$30,900	$34,300	$16,800	$18,500	$1,520	$1,680
SOL-2	$5,620	$15,400	$3,130	$8,160	$283	$737
SOL-3	$11,500,000	$13,200,000	$5,780,000	$6,630,000	$523,000	$599,000
SON-1	$182,000	$189,000	$94,200	$97,500	$8,520	$8,810
SON-2	$3,530	$9,460	$2,020	$5,070	$183	$459
SON-3	$5,580,000	$5,800,000	$2,830,000	$2,940,000	$256,000	$266,000
STB-2	$10,900,000	$11,500,000	$5,520,000	$5,820,000	$499,000	$526,000
STB-3	$15,400	$15,400	$13,400	$13,400	$1,210	$1,210
STB-5	$3,090	$3,090	$2,710	$2,710	$245	$245
STB-6	$13,500,000	$13,200,000	$6,830,000	$6,660,000	$618,000	$602,000
STB-7	$38,200	$38,200	$33,400	$33,400	$3,020	$3,020
STC-1	$27,400,000	$26,900,000	$13,800,000	$13,500,000	$1,250,000	$1,220,000
STC-2	$19,000,000	$18,200,000	$9,590,000	$9,190,000	$867,000	$830,000
VEN-1	$22,800,000	$24,000,000	$11,500,000	$12,100,000	$1,040,000	$1,090,000
VEN-3	$6,810,000	$6,690,000	$3,430,000	$3,370,000	$310,000	$305,000
Total			**$460,000,000**	**$464,000,000**	**$41,600,000**	**$42,000,000**

Note: Totals may not sum due to rounding.
* When increasing the buffered area from 60 ft. to 200 ft., areas otherwise defined as "baseline" become subject to incremental impacts. In such instances where the baseline acreage decreases under the "high" scenario, the "low" impacts will exceed "high" impacts.

EXHIBIT 6-8 AGRICULTURAL CROP FARMING INCREMENTAL ECONOMIC IMPACTS (2009 - 2028, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST		ANNUALIZED	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-2	$380,000	$468,000	$195,000	$239,000	$17,700	$21,600
CCS-1	$1,030,000	$1,110,000	$521,000	$561,000	$47,100	$50,700
CCS-2	$15,900,000	$16,500,000	$7,980,000	$8,320,000	$721,000	$752,000
ELD-1	$2,060,000	$2,380,000	$1,040,000	$1,200,000	$93,600	$108,000
MNT-1	$0	$0	$0	$0	$0	$0
MNT-2	$9,050,000	$9,130,000	$4,560,000	$4,590,000	$412,000	$415,000
MNT-3	$3,080	$3,080	$2,690	$2,690	$244	$244
MRN-1	$12,000,000	$13,000,000	$6,050,000	$6,550,000	$547,000	$592,000
MRN-2	$67,800,000	$71,800,000	$34,100,000	$36,100,000	$3,080,000	$3,260,000
MRN-3	$1,050,000	$1,820,000	$531,000	$914,000	$48,000	$82,700
NAP-1	$65,400	$228,000	$33,000	$115,000	$2,980	$10,400
NEV-1	$2,820,000	$4,020,000	$1,420,000	$2,020,000	$128,000	$183,000
RIV-1	$460	$460	$402	$402	$36	$36
SCZ-1	$28,300,000	$30,200,000	$14,200,000	$15,200,000	$1,290,000	$1,370,000
SCZ-2	$3,110,000	$4,650,000	$1,560,000	$2,340,000	$141,000	$211,000
SLO-1	$2,810,000	$3,200,000	$1,410,000	$1,610,000	$128,000	$145,000
SLO-2	$24,400,000	$25,100,000	$12,300,000	$12,600,000	$1,110,000	$1,140,000
SLO-3	$24,000,000	$24,900,000	$12,100,000	$12,500,000	$1,090,000	$1,130,000
SLO-4	$2,010,000	$2,070,000	$1,010,000	$1,040,000	$91,600	$94,300
SNB-1	$5,950,000	$6,790,000	$2,990,000	$3,420,000	$271,000	$309,000
SNB-2	$1,950	$1,950	$1,700	$1,700	$154	$154
SNB-3	$7,080,000	$7,150,000	$3,560,000	$3,600,000	$322,000	$325,000
SNM-1	$5,210,000	$7,230,000	$2,620,000	$3,640,000	$237,000	$329,000
SNM-2	$28,200,000	$30,500,000	$14,200,000	$15,300,000	$1,280,000	$1,390,000
SOL-1	$395,000	$568,000	$199,000	$286,000	$18,000	$25,900
SOL-2	$9,320,000	$9,730,000	$4,690,000	$4,890,000	$424,000	$442,000
SOL-3	$1,950,000	$2,370,000	$982,000	$1,190,000	$88,800	$108,000
SON-1	$176	$176	$154	$154	$14	$14
SON-2	$184	$184	$161	$161	$15	$15
SON-3	$80,600	$91,700	$40,600	$46,200	$3,670	$4,180
STB-2	$3,990,000	$4,240,000	$2,010,000	$2,130,000	$182,000	$193,000
STB-3	$539,000	$580,000	$273,000	$294,000	$24,700	$26,600
STB-5	$2,660,000	$2,730,000	$1,340,000	$1,370,000	$121,000	$124,000
STB-6	$6,460,000	$6,840,000	$3,250,000	$3,440,000	$294,000	$311,000
STB-7	$8,770,000	$8,770,000	$4,420,000	$4,420,000	$399,000	$399,000
STC-1	$9,290,000	$9,800,000	$4,670,000	$4,930,000	$423,000	$446,000
STC-2	$19,400,000	$22,100,000	$9,750,000	$11,100,000	$882,000	$1,000,000
VEN-1	$2,410,000	$2,600,000	$1,210,000	$1,310,000	$109,000	$118,000
VEN-3	$2,830,000	$3,430,000	$1,420,000	$1,730,000	$128,000	$156,000
Total			**$157,000,000**	**$169,000,000**	**$14,200,000**	**$15,300,000**

6.5 SOURCES OF UNCERTAINTY

122. It is important to recognize the uncertainty inherent in the assumptions underlying this analysis. Exhibit 6-9 summarizes these uncertainties and their potential effect on estimated economic impacts.

EXHIBIT 6-9 SUMMARY OF CAVEATS TO AGRICULTURAL CROP FARMING ANALYSIS

ASSUMPTION	POTENTIAL EFFECT ON RESULTS
This analysis assumes farmers are aware and fully comply with the court-ordered injunction establishing no pesticide use areas. However, according to discussions with stakeholders, there is no ongoing enforcement of the court-ordered injunction by either the California Department of Pesticide Regulation or the EPA.[89] To the extent that farmers are not aware or do not comply with the court-ordered injunction, this analysis may overstate economic impacts.	+
This analysis assumes that the court-ordered injunction restricting pesticide use represents the likely outcome of future section 7 consultations between EPA and the Service for this activity. To the extent that future consultations find more flexible ways to avoid jeopardy or adverse modification (e.g., adjustments in cropping or pesticide use practices), this analysis may overstate future economic impacts.	+
To the extent that there are alternative beneficial uses of agricultural land (e.g., organic farming or grazing), this analysis may overstate future economic impacts.	+
This analysis is not able to forecast whether pesticide use restrictions will result in additional acres lost from agricultural production outside of the buffer areas. To the extent that limitations on pesticide use in the study area result in economic conditions that preclude the grower to use additional acres of farming land outside the study area (e.g., remaining area unavailable is economically unviable to cultivate), this analysis may understate economic impacts.	-
The administrative costs of consultation are based on the average estimated administrative costs presented in Exhibit 2-2. However, discussions with EPA staff suggest that the administrative costs of consultation for the review of pesticide effect determinations may be greater than for an average project-based consultation due to the complexity of the information collected and analyzed in each pesticide assessment. For example, the geographic scope for each assessment includes all areas identified in the court-ordered injunction, whereas a typical project modification generally involves a defined project action and associated project area. To the extent that administrative costs for consultations on each pesticide effects determination is greater than the average administrative costs of consultation presented in Exhibit 2-2, this analysis may underestimate future economic costs.[90]	-
This analysis assumes that EPA will not have to reinitiate effects determination for pesticides already completed due to the designation of critical habitat. To the extent that critical habitat designation, requires EPA to revisit pesticide effects determinations previously completed, this analysis may underestimate future economic costs.	-
This analysis assumes that impacts to NRCS projects are relatively small. To the extent that NRCS projects are affected more significantly, this analysis may underestimate future economic costs.	-
+: This assumption may result in an overestimate of real costs. -: This assumption may result in an understatement of real costs. +/-: The assumption has an unknown effect on estimates.	

[89] Personal communication with Arty Williams, EPA, January 13, 2009; Personal communication with Polo Moreno, California Department of Pesticide Regulation, December 31, 2008.

[90] Personal communication with Arty Williams, EPA, January 13, 2009.

CHAPTER 7 | GRAZING & RANCHING

123. Grazing and ranching are major land uses in the study area. Based on the California Department of Conservation's FMMP, approximately 752,000 acres on private lands and 152,000 acres on public lands are used for grazing and ranching activities within the study area.

124. Livestock grazing can both directly and indirectly impact the frog. Some of the impacts of overgrazed (or unmanaged) grazing include:

- Higher instream water temperatures resulting from reduction or removal of vegetation;
- Channel downcutting;
- Lowered water tables;
- Loss of plunge pools, which results in direct loss of pool habitats for the frog; and
- Diminished water quality through increased sediment loads and nutrient levels.[89]

125. Although grazing and ranching activities are listed as threats in the proposed rule, historically, the frog has had little impact on grazing and ranching activities. These activities fall mainly outside of the purview of the Service because they lack a Federal nexus. Moreover, in 2006 the Service issued a Special Rule under Section 4(d) exempting take of the frog due to routine ranching activities on non-Federal lands in order to encourage continued responsible land uses that provide an overall benefit to the species.

126. However, there are other ways that grazing and ranching activities may be affected by the designation of critical habitat. Based on a review of public comments and conversations with several private ranchers in Calaveras County, of most concern to private landowners is the potential decline in wealth resulting from a reduced ability to convert ranching land to alternative uses such as residential or commercial development. These potential impacts are estimated as part of the residential and commercial development analysis presented in Chapter 4.

127. An additional way that grazing and ranching activities may be affected is through section 7 consultation on grazing and ranching projects that receive Federal funding (e.g., through the NRCS) or grazing activities that occur on Federal lands. Impacts to grazing and ranching activities are summarized in Exhibit 7-1 and discussed in detail in the following sections.

[89] 71 FR 19244

EXHIBIT 7-1 SUMMARY OF IMPACTS TO GRAZING ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS	
	LOW	HIGH
Pre-Designation Impacts (1996 - 2008)		
ALA-1A	$6,070	$6,070
ALA-1B	$16,500	$16,500
ALA-2	$223,000	$223,000
CAL-1	$17,200	$27,500
ELD-1	$4,350	$4,350
NEV-1	$9,510	$9,510
PLA-1	$4,260	$4,260
Total	**$281,000**	**$291,000**
Post-Designation Incremental Impacts (2009 - 2030)		
ALA-1A	$5,830	$5,830
ALA-1B	$16,200	$16,200
ALA-2	$245,000	$245,000
Total	**$267,000**	**$267,000**
Note: Totals may not sum due to rounding.		

7.1 PRE-DESIGNATION IMPACTS

7.1.1 GRAZING AND RANCHING ACTIVITIES ON PRIVATE LANDS

128. In the 1996 final listing rule for the frog, the Service cited livestock grazing as a contributing factor in the decline of the frog.[90] Grazing livestock in frog-occupied areas may trample individual frogs or frog egg masses. Overgrazing of riparian areas may cause detrimental affects to aquatic systems and negatively affect riparian and instream aquatic habitat.

129. However, since the final listing of the frog, the Service's understanding of the impact of livestock grazing has substantially evolved. Stock pond and small reservoir impoundments created as a part of livestock ranching activities can provide suitable breeding habitat for the frog. The Service's research found that in many areas, the presence of the frog is due solely to the construction of these small ponded habitats. Accordingly, in recognition of the beneficial (or neutral) impact that managed livestock grazing at low to moderate levels has on frog habitat, the Service issued a Special Rule under Section 4(d) exempting take of the frog due to routine ranching activities on non-Federal lands in order to encourage continued responsible land uses that provide an

[90] 61 FR 25813.

overall benefit to the species.[91] Accordingly, under the Special Rule Exemption for routine ranching activities, this analysis assumes ranchers on non-Federal lands will not experience economic impacts with respect to routine ranching activities due to critical habitat designation.[92]

130. The grazing and ranching sector may also be affected by the designation of critical habitat through section 7 consultation on grazing and ranching projects that receive Federal funding. This potential nexus is usually established through programs such as the Environmental Quality Incentives Program (EQIP) and the Wildlife Habitat Incentives Program (WHIP), cost share programs that provide ranchers and farmers with access to financial, educational and technical assistance. Since the species listing in 1996, there have been three section 7 consultations for the frog and/or its habitat with the NRCS on programs that assist landowners on private lands with projects designed to restore habitat or control erosion and sedimentation. However, two of these consultations were conducted outside the study area. The third consultation involved approval of a Coordinated Permit Program for Alameda County's Wildlife-friendly Pond Restoration Program.[93] This program offers Alameda County ranchers cost-share funding and technical assistance for livestock pond restoration specifically designed to benefit the frog as well as the California tiger salamander. Under the coordinated permit program, NRCS provides funding for five to six livestock pond restoration projects each year. According to discussions with NRCS staff, the administrative cost of preparing and participating in the consultation on the Coordinated Permit Program was $175,000 over three years from 2002 to 2004.[94]

Indirect impacts

131. Grazing and ranching landowners may also be indirectly affected as a result of frog conservation efforts. In Calaveras County (CAL-1), one landowner reported economic impacts as a result of delays in repair and maintenance of the ranch's single access road due to section 7 consultation for the frog. Based on discussions with the landowner, road delays persisted for three years. During this time the road's condition continued to deteriorate, eventually prohibiting use of the road by large trucks that deliver hay for the ranch and transport cattle to auction. The affected landowner estimated indirect economic impacts of $5,000 to $8,000 per year from 2005 to 2007.[95]

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[91] 71 FR 19244.

[92] As previously discussed, owners of ranching land may experience a decline in wealth resulting from a reduced ability to convert ranching land to alternatives uses such as residential or commercial development. These potential impacts are estimated as part of the residential and commercial development analysis presented in Chapter 4.

[93] For more detail, see Alameda County Resource Conservation District. Wildlife-friendly Pond Program. Accessed on December 27, 2008. http://www.acrcd.org/ForRuralLandowners/WildlifeFriendlyPondsProgram/tabid/85/Default.aspx

[94] Personal communication with Terrence Huff, USDA, Natural Resources Conservation Service, District Conservationist, January 5, 2009.

[95] Personal communication with Franciska Schabram, January 12, 2009.

7.1.2 GRAZING AND RANCHING ACTIVITIES ON FEDERAL LANDS

132. Grazing activities on Federal lands are not subject to the Special Rule Exemption for routine ranching activities. According to the proposed rule, grazing activities are a threat to the frog in 12 critical habitat units.[96] Based on available GIS data, of these units, only two units contain Federal lands used for grazing activities. Exhibit 7-2 provides detailed information on the number of acres of Federal grazing lands included in the proposed designation by allotment and critical habitat unit.

EXHIBIT 7-2 CHD UNITS THREATENED BY GRAZING ACTIVITIES (ACRES)

UNIT	FEDERAL LAND MANAGER	ALLOTMENT NAME	TOTAL ALLOTMENT AREA (ACRES)	AREA PROPOSED AS CRITICAL HABITAT (ACRES)	% OF ALLOTMENT PROPOSED AS CRITICAL HABITAT
SOL-1	BLM	Bluestone Ridge	2,953	159	5.4%
SOL-3	USFS	Big & Little Falls	2,223	1,481	66.6%
		Tule	2,512	34	1.3%
		Upper Lopez	1,303	1,075	82.5%
		Morro Creek	4,966	4,966	100.0%
		Pine Knob	1,338	1,338	100.0%
		Salsipuedes	1,235	157	12.7%
		TOTAL	**18,594**	**9,221**	**49.6%**

Source: Grazing allotment data obtained from the following sources:

BLM: BLM California Range Allotments (GIS coverage); available at: http://www.blm.gov/ca/gis/index.html

USFS: Rangeland Management Units (GIS Coverage); available at: http://www.fs.fed.us/r5/rsl/clearinghouse/gis-download.shtml#rangemgt

133. Since the species listing in 1996, there has been only one section 7 consultation for the frog on grazing activities on Federal lands. The consultation, conducted in 2002, addressed grazing in the Tahoe and Eldorado National Forests. Conservation measures to protect the frog and/or its habitat from grazing activities are limited to implementation of best management practices in Riparian Conservation Areas as described in the Sierra Nevada Forest Plan Amendment Standards and Guidelines for Aquatic and Riparian Ecosystems and conducting surveys of suitable frog habitat. According to discussions with U.S. Forest Service (USFS) and BLM staff, past conservation measures undertaken for the frog have not resulted in any reduction in the number of available grazing animal unit months (AUMs).[97] Accordingly, past conservation activities to protect the frog are

[96] Excludes one unit (SNB-3, Pinnacles National Monument) where the identified grazing threat is from feral pigs (73 FR 53492).

[97] Personal communication with: Valerie Hubbartt, Wildlife Biologist, Los Padres National Forest, on December 1, 2008; Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009; Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

limited to the section 7 administrative costs of approximately $12,000 and frog survey and monitoring costs estimated in Chapter 12.

7.2 POST-DESIGNATION IMPACTS

134. The most likely Federal nexus for future section 7 consultations with grazing and ranching lands is through projects receiving Federal funding through the NRCS. The coordinated permit currently in place for the Alameda County Wildlife-friendly Pond Restoration Program is set to expire at the end of 2009. According to NRCS staff, due to the administrative costs associated with the previous consultation for the coordinated program, NRCS is not currently planning on initiating another consultation to extend the existing coordinated permit program. Accordingly, with the designation of critical habitat, NRCS will be required to consult on a project-by-project basis for all future projects initiated under the Wildlife-friendly Pond Restoration Program. As a result of the additional administrative costs and delay associated with project-by-project section 7 consultation, NRCS anticipates reducing the number of projects funded to one to two per year.[98] Accordingly, these administrative costs from section 7 consultation are considered incremental as NRCS would not be required to consult in the absence of critical habitat designation.[99]

7.3 SOURCES OF UNCERTAINTY

135. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data and the difficulty of forecasting future projects in the study area. To the extent that future projects were not identified, total impact estimates may increase as information becomes available.[100]

[98] While the potential loss of NRCS funding for additional wildlife-friendly projects represents a potential impact due to critical habitat designation, the distribution of Federal funding to private landowners represents a transfer of money and not a change in real resources. Accordingly, this impact is not quantified in this analysis. If the activities undertaken through those projects results in the creation of value for recipients landowners, additional economic impacts may result.

[99] Personal communication with Terrence Huff, USDA, Natural Resources Conservation Service, District Conservationist, January 5, 2009.

[100] For example, NRCS staff report expressed interest in the Wildlife-friendly Pond Restoration Program by additional ranchers in Santa Barbara, Calaveras, El Dorado, and Shasta Counties. (Personal communication with Terrence Huff, USDA, Natural Resources Conservation Service, District Conservationist, January 5, 2009)

CHAPTER 8 | TIMBER HARVEST ACTIVITIES

136. This section describes the potential economic impacts of frog conservation on timber harvest activities in the study area. Timber operations can both directly and indirectly affect the frog. According to the Recovery Plan, some of the impacts of timber operations include:

> "Access roads, haul roads, skid trails, and ground based [tractor] yarding systems have great impacts related to sedimentation and compaction. Wet weather operations also have more potential for impacts. Timber harvesting in upland habitat can also impact California red-legged frogs by causing direct harm or injury to frogs that may be dispersing or sheltering."[101]

137. According to the proposed rule, timber activities are a threat to the frog in five critical habitat units, located across five California counties: BUT-1, YUB-1, NEV-1, PLA-1, and ELD-1. Within these units, approximately 5,070 acres (19 percent of the five critical habitat units threatened by timber activities, but less than one percent of the study area) are currently managed or have the potential to be managed for timber harvest activities.

138. Exhibit 8-1 provides an overall summary of impacts to timber harvest activities as described in the remainder of this chapter. Frog conservation measures required for timber harvest activities are primarily designed to preserve aquatic and riparian habitat and protect forested areas immediately adjacent to waterbodies. Accordingly, many of these conservation measures are expected to occur even in the absence of the frog and its habitat as a result of existing Federal and State regulations designed to protect water quality, aquatic and riparian areas, and streambed structure in forested areas where timber harvest occurs. Because of the level of existing measures that result in protection of frog habitat, the incremental impacts of critical habitat designation are forecast to be administrative and relatively minor.

139. This chapter begins with a description of timber harvest activities in the five critical habitat units where timber harvest is identified as a threat to the frog and its habitat. Second, it describes current Federal and State regulations affecting timber harvest activities in the study area. The third section describes the analytic approach applied to quantify impacts of frog conservation on timber harvest activities. The final sections present the results of the analysis by critical habitat unit and highlight the major assumptions and caveats of the analysis.

[101] U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.

EXHIBIT 8-1 SUMMARY OF IMPACTS TO TIMBER HARVEST ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

VALUES	LOW	HIGH
Pre-Designation Impacts (1996 – 2008)		
Present Value of Impacts	$131,000	$131,000
Post-Designation Baseline Impacts (2009 – 2030)		
Present Value of Impacts	$73,400	$73,400
Annualized Impact Value	$6,630	$6,630
Incremental Impacts (2009 – 2030)		
Present Value of Impacts	$10,300	$10,300
Annualized Impact Value	$930	$930

8.1 TIMBER HARVEST ACTIVITIES IN THE STUDY AREA[102]

140. Timber harvest activities in the study area range from selective harvests, where only a few trees are harvested, to large-scale clearcuts, where all trees in a given area are harvested.[103] Although the majority of timber harvests are implemented for commercial purposes, some timber harvests are implemented to maintain specific natural communities of ecological value, as well as to minimize the risk of future wildland fires.[104]

141. The primary landowners in the five critical habitat units where timber harvest activities are identified as a threat to the frog, include private owners (approximately 16,000 acres), the USFS (approximately 8,600 acres), BLM (approximately 1,840 acres), and the California Department of Parks and Recreation (CDPR, approximately 250 acres).[105] The USFS land contains portions of three National Forests, including Plumas (BUT-1 and YUB-1), Eldorado (NEV-1 and PLA-1), and Tahoe (ELD-1).

142. Commercial timber harvest occurs on private timberlands and National Forest land within the five critical habitat units threatened by timber activities. Specifically, ongoing or proposed timber harvests occur on 4,080 acres of private timberland, while 990 acres of the Plumas National Forest are considered suitable for commercial timber harvest.[106] The

[102] The study area for timber harvest activities is limited to the five critical habitat units where timber harvest activities are identified as a threat to the frog and its habitat in the proposed rule: BUT-1, YUB-1, NEV-1, PLA-1, and ELD-1. (73 FR 53492)

[103] Based on a review of past timber harvest plans on State and private timberlands. Accessed online at: ftp://thp.fire.ca.gov/THPLibrary/ on January 2, 2009.

[104] Personal communication with Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009; and, Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009.

[105] Based on GIS analysis using proposed critical habitat and ownership data received from the Service on September 22, 2008 and December 16, 2008.

[106] Based on GIS analysis using spatial data from the California Department of Forestry and Fire Protection accessed online at: ftp://ftp.fire.ca.gov/forest/ on December 22, 2008; and, the U.S. Forest Service accessed online at: http://www.fs.fed.us/r5/rsl/clearinghouse/gis-download.shtml on January 7, 2009.

remaining forested areas in Plumas, Eldorado, and Tahoe National Forests are not considered suitable for timber harvest due to forest conditions and existing management objectives. Although the BLM engages in forest management activities designed to maintain natural communities of interest and limit the potential for wildland fires, they do not actively manage their land for timber harvest in the study area.[107] Thus, the effects of frog conservation on BLM land are not considered in this chapter. CAL FIRE actively manages State land for research purposes and to demonstrate different management techniques, however, CAL FIRE similarly does not implement commercial timber harvests on State lands.[108] This analysis quantifies impacts related to frog conservation on such non-commercial timber management. Exhibits 8-2 and 8-3 illustrate the areas currently or potentially managed for commercial timber harvest on private land and National Forests in the five critical habitat units threatened by timber harvest activities.

EXHIBIT 8-2 AREAS MANAGED FOR TIMBER ON FEDERAL AND PRIVATE LANDS BY UNIT

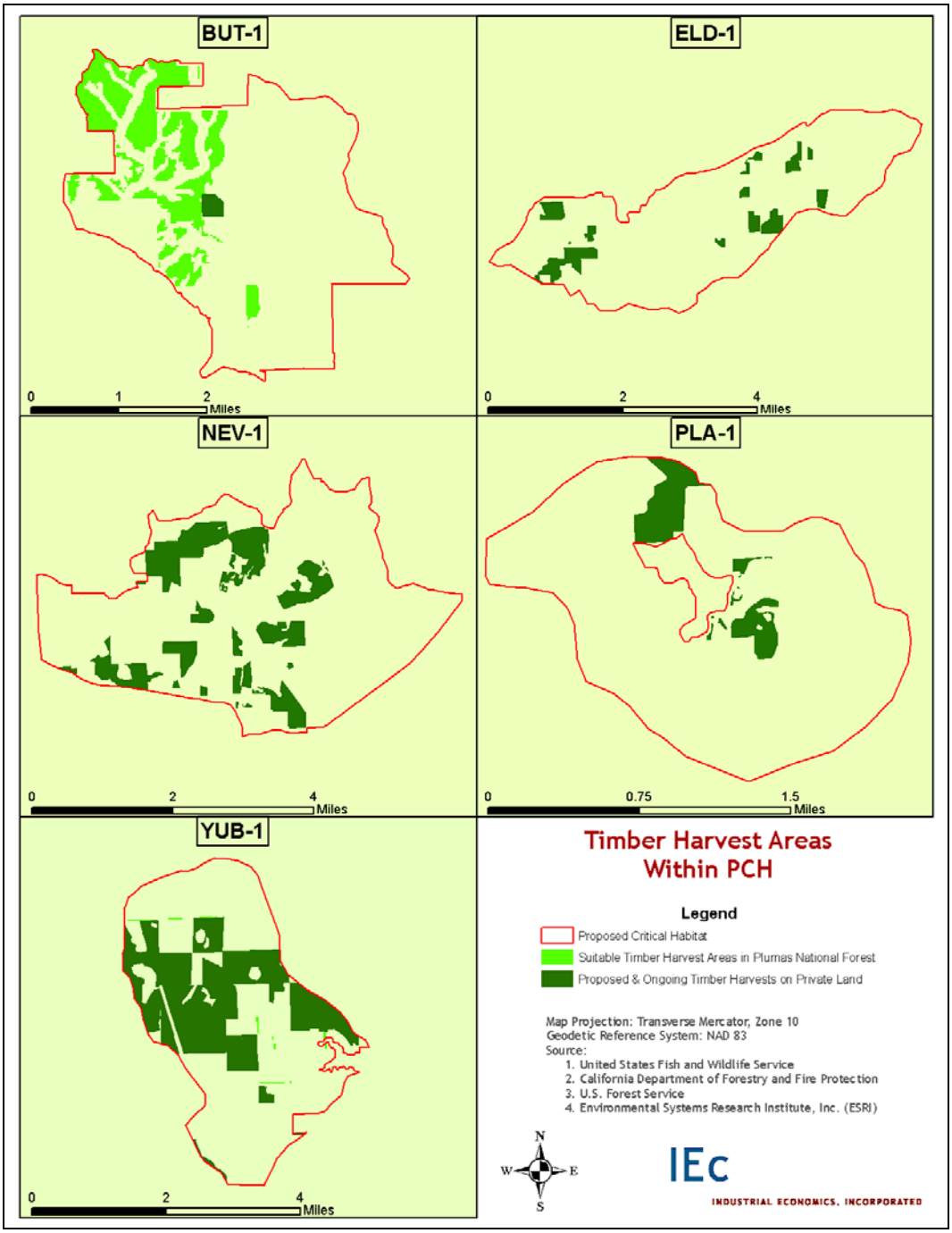
UNIT	TOTAL ACRES	ACRES MANAGED FOR TIMBER			PERCENT OF UNIT MANAGED FOR TIMBER
		FEDERAL	PRIVATE	TOTAL	
BUT-1	5,290	963	38	1,000	19%
ELD-1	5,530	0	424	424	8%
NEV-1	8,290	0	1,450	1,450	17%
PLA-1	1,240	0	82	82	7%
YUB-1	6,320	27	2,090	2,120	0
Total	**26,700**	**990**	**4,080**	**5,070**	

Sources:
1.) California Department of Forestry and Fire Protection. 2008. Timber Harvest Plan GIS Data for Butte, Eldorado, Nevada, Placer, and Yuba Counties. Accessed online at: ftp://ftp.fire.ca.gov/forest/ on December 22, 2008.
2.) U.S. Forest Service. 2006. Land & Resource Management Plan, Land Suitability Class, Region 5, National Forest, California. Accessed online at: http://www.fs.fed.us/r5/rsl/clearinghouse/gis-download.shtml on January 7, 2009.

[107] Personal communication with Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009.

[108] Written communication with Chris Browder, California Department of Forestry and Fire Protection, January 9, 2009.

EXHIBIT 8-3 TIMBER HARVEST AREAS WITHIN THE FIVE CHD UNITS THREATENED BY TIMBER HARVEST ACTIVITIES



8.2 BASELINE REGULATIONS AFFECTING TIMBER HARVEST ACTIVITIES

143. Conservation measures required to protect the frog are primarily designed to preserve water quality and protect forested areas immediately adjacent to waterbodies. Accordingly, many of these conservation measures are expected to occur even in the absence of the frog and its habitat as a result of existing Federal and State regulations designed to protect water quality, aquatic and riparian areas, and streambed structure in forested areas used for timber harvest activities. This section describes existing baseline protections provided by Federal and State regulations that may affect proposed critical habitat areas used for timber harvest activities.

8.2.1 TIMBER HARVEST ACTIVITIES ON THE PLUMAS NATIONAL FOREST

144. All of the National Forests in the study area are covered by the Sierra Nevada Forest Plan Amendment (SNFPA) and, as such, are subject to the standards and guidelines included in the SNFPA.[109] The SNFPA standards and guidelines include detailed measures for protecting aquatic and riparian habitats and the species that inhabit such areas.[110] These measures provide significant baseline conservation benefits to the frog and its habitat within timber harvest areas on Federal lands. The specific aquatic and riparian standards and guidelines included in the SNFPA that also benefit the frog and its habitat include:

- Establish riparian conservation area (RCA) buffers as follows:

  Perennial Streams/Special Aquatic Features: 300 feet on each side of waterbody;

  Seasonal Streams: 150 feet on each side of stream;

  Streams in Inner Gorge: Top of inner gorge; and

  Other: RCA width and protection measures determined through project level analysis.

- Assess and document aquatic conditions following the Regional Stream Condition Inventory protocol prior to implementing ground disturbing activities within suitable habitat for the frog.

- Limit application of pesticides in RCAs and critical aquatic refuges (CARs) to cases where project-level analysis indicates their application is consistent with the Riparian Conservation Objectives.[111]

- Avoid application of pesticides to areas within 500 feet of known occupied sites for the frog, unless environmental analysis documents pesticides are needed to restore or enhance habitat for the frog.

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[109] U.S. Forest Service. 2004. Record of Decision: Sierra Nevada Forest Plan Amendment – Final Supplemental Environmental Impact Statement. United States Department of Agriculture, Forest Service, Pacific Southwest Region.

[110] U.S. Forest Service. 2004. Record of Decision: Sierra Nevada Forest Plan Amendment – Final Supplemental Environmental Impact Statement. United States Department of Agriculture, Forest Service, Pacific Southwest Region.

[111] CARs are designated for areas containing known populations of threatened or endangered amphibians (i.e., the frog, foothill and mountain yellow-legged frog, Yosemite toad, Cascades frog, and the northern leopard frog). The objective of RCAs is to maintain the ecological integrity of aquatic, riparian, and meadow ecosystems.

- Ensure that appropriate mitigation measures (e.g., utilize low ground pressure equipment, helicopters, over the snow logging, or other non-ground disturbing actions to operate off of existing roads; and, ensure that existing roads, landings, and skid trails meet Best Management Practices) are enacted within RCAs and CARs to: minimize the risk of activity-related sediment entering aquatic systems; and, minimize impacts to habitat for aquatic- or riparian-dependent plant and animal species.
- Ensure management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.
- Prohibit storage of fuels and other toxic materials within RCAs and CARs except at designated administrative sites.

The majority of timber harvest activities in the Plumas National Forest occur outside of RCAs and CARs. For example, of the 990 acres in Plumas National Forest considered suitable for timber harvest, only eight acres are located within CAR areas.[112,113] None of the suitable timber harvest areas are located within RCAs.

8.2.2 TIMBER HARVEST ACTIVITIES ON STATE AND PRIVATE TIMBERLANDS

145. All timber harvests on State and private timberlands in California must comply with the California Forest Practice Rules (CFPR). The CFPR establish guidelines for managing timber in California with the goal of achieving:

> "maximum sustained production of high-quality timber products…while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment."[114]

146. Article 6 of the CFPR includes guidelines addressing watercourse and lake protection during timber harvest activities in and around aquatic and riparian habitats. These measures provide significant baseline conservation benefits to the frog and its habitat within timber harvest areas on State and private lands. The specific watercourse and lake protection guidelines included in the CFPR that also benefit the frog and its habitat include:[115]

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[112] Based on GIS analysis using spatial data from the U.S. Forest Service accessed online at: http://www.fs.fed.us/r5/rsl/clearinghouse/gis-download.shtml on January 7, 2009.

[113] The eight acres on suitable timber harvest land in Plumas National Forest located within CAR areas is likely due to a spatial data alignment issue. It is unlikely that any suitable timberland in Plumas National Forest is located in CAR areas.

[114] California Department of Forestry and Fire Protection. 2008. California Forest Practice Rules 2008. Title 14, California Code of Regulations: Chapters 4, 4.5, and 10. California Department of Forestry and Fire Protection, Resource Management, Forest Practice Program. Sacramento, California.

[115] California Department of Forestry and Fire Protection. 2008. California Forest Practice Rules 2008. Title 14, California Code of Regulations: Chapters 4, 4.5, and 10. California Department of Forestry and Fire Protection, Resource Management, Forest Practice Program. Sacramento, California.

- Establish watercourse and lake protection zone (WLPZ) buffer areas as follows:[116]

  Class I Waterbodies: 75 to 150 feet depending on the slope of the land adjacent to the waterbody;

  Class II Waterbodies: 50 to 100 feet depending on the slope of the land adjacent to the waterbody;

  Class III & Class IV Waterbodies: Buffer areas determined based on site inspections.

- Within WLPZ buffer areas:
  - At least 75 percent surface cover and undisturbed area shall be retained.
  - For Class I waterbodies, at least 50 percent of the overstory and 50 percent of the understory canopy covering the ground and adjacent waters shall be left in a well distributed multi-storied stand, similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25 percent of the existing overstory conifers.
  - For Class II and Class IV waterbodies, at least 50 percent of the total canopy covering the ground shall be left in a well distributed multi-storied stand, similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25 percent of the existing overstory conifers.
  - For Class III waterbodies, at least 50 percent of the understory vegetation present before timber operations shall be left living and well distributed.
- Trees cut within WLPZ buffer areas shall be felled away from the watercourse by pulling or other mechanical methods.
- Heavy equipment shall not be used in timber falling, yarding, or site preparation within WLPZ buffer areas.

8.3 ANALYTIC APPROACH

147. The following subsections describe the analytic approach applied for timber harvest activities on USFS lands, State lands, and private timberlands within the five proposed critical habitat units where timber harvest activities are identified as a threat to the frog and its habitat.

[116] Water classes are defined as follows: **Class I**: Domestic water supplies, including springs, onsite and/or within 100 feet downstream of the operations area and/or, those waterbodies where fish are always or seasonally present onsite, including habitat to sustain fish migration and spawning; **Class II**: Those waterbodies where fish are always or seasonally present offsite within 1,000 feet downstream and/or, waterbodies which contain aquatic habitat for non-fish aquatic species; **Class III**: Waterbodies with no aquatic life present, watercourse showing evidence of being capable of sediment transport to Class I and II waters under normal high water flow conditions after completion of timber operations; and, **Class IV**: Man-made watercourses, usually supplying downstream, established domestic, agricultural, hydroelectric supply or other beneficial uses.

8.3.1 TIMBER HARVEST ACTIVITIES ON NATIONAL FORESTS

148. As previously discussed, standards and guidelines under the SFNPA include detailed measures for protecting aquatic and riparian habitats. Given the comprehensive set of conservation measures protecting the aquatic and riparian habitats included in the SNFPA, few additional conservation measures are required specifically for the frog.[117] A review of the consultation history, as well as discussions with USFS staff, indicate that measures outlined in the SNFPA are sufficient to protect the frog during timber harvests in the Plumas National Forest. That is, the Service has not required any additional frog-specific conservation measures to be implemented as part of section 7 consultation.[118,119,120] Rather, the standards and guidelines are implemented as part of general management objectives to preserve aquatic and riparian habitats and associated species and would be implemented even in the absence of the frog and its habitat. Further, none of the three National Forests expects to implement additional conservation measures for the frog in the future.[121] Accordingly, impacts on timber harvest activities on USFS lands is limited to frog surveying efforts (quantified in Chapter 12) and the administrative costs of section 7 consultation quantified in this section.

8.3.2 TIMBER HARVEST ACTIVITIES ON STATE LANDS

149. Non-commercial timber harvest occurs on State lands in the study area for research purposes and to demonstrate different management techniques. This analysis relies on personal communication with CAL FIRE, the responsible State agency, to estimate impacts related to frog conservation on non-commercial timber management on State lands. Impacts on timber management activities are related to implementing measures to avoid take of the frog similar to those detailed for timber harvests on private lands in the following section.[122]

8.3.3 TIMBER HARVEST ACTIVITIES ON PRIVATE LANDS

150. Under the CFPR, a Timber Harvest Plan (THP) must be prepared by a Registered Professional Forester (RPF) and submitted to CAL FIRE, the authorized oversight agency, for approval. THPs are environmental review documents that outline what timber will be harvested, how it will be harvested, and the steps that will be taken to prevent damage to the environment. CAL FIRE reviews THPs under CEQA as a

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[117] Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[118] Review of Formal Consultation History from 1996 through 2008.

[119] Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[120] Eldorado National Forest noted that the standard, which limits pesticide application to areas at least 500 feet away from known occupied sites for the frog and other endangered or threatened amphibians, is implemented specifically for the frog. However, there are no economic impacts associated with the implementation of this standard. Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009.

[121] Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[122] Written communication with Chris Browder, California Department of Forestry and Fire Protection, January 9, 2009.

'responsible agency' and trustee of the State's natural resources. As a result of its review, CAL FIRE may recommend changes to the THP so that significant impacts to natural resources, or take of a listed species, will be avoided.[123]

151. To identify and estimate future impacts to timber activities on private lands, this analysis employs a four-step process:

Step 1: Determine Where Conservation Measures Will Be Required During Timber Harvest

152. The Service issued Take Avoidance Scenarios for timber harvest plans for the frog on March 25, 2008.[124] Based on this memorandum, CAL FIRE issued additional guidance on July 28, 2008 providing recommendations to project proponents based on the location of proposed timber operations within the current or historic ranges of the frog as defined in the 2002 Recovery Plan.[125,126] The end result of following this guidance varies, but may include the development of a formal consultation and associated project modifications. Exhibit 8-4 demonstrates the three most common results of following the CAL FIRE guidance. Conservation measures required for the frog during timber harvest activities differ for each of the three pathways as discussed below.

- **Frogs Present Scenario:** Frogs are assumed to be present in a timber harvest area if the area falls within the current range of the frog, as defined by the 2002 Recovery Plan. In this case, landowners are required to implement frog conservation measures during timber harvest activities.

  In areas that fall outside of the current range of the frog, but within the historic range, CAL FIRE recommends conducting focused field surveys to determine frog presence. Ideally this analysis would rely on data about the frequency that field surveys result in detection of the frog, however, according to discussions with CAL FIRE, data on the results of focused field surveys are not tracked. Accordingly, this analysis relies on the CNDDB to identify areas where frogs are assumed to be present. Specifically, this analysis assumes that surveys conducted within one mile of past frog occurrences documented in the CNDDB will detect the frog (i.e., the frog is assumed to be present in the timber harvest area). In these cases, landowners will implement the same conservation measures as required for timber harvest activities occurring within the current range of the frog.

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[123] California Department of Forestry and Fire Protection, Resource Management: Forest Practice. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice.php on January 7, 2009.

[124] U.S. FWS. "Revised CRLF Information Needs and Take Avoidance Scenarios. Available at: http://www.fire.ca.gov/resource_mgt/downloads/USFWS_Revised_CRLF_InfoNeeds&TakeAvoidanceScenarios_032508.pdf.

[125] California Department of Forestry and Fire Protection. 2008. Recommendations for Addressing California Red-Legged Frog Take Avoidance in Timber Harvesting Documents. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php on November 25, 2008.

[126] U.S. Fish and Wildlife Service. 2002. Recovery Plan for the California Red-legged Frog (Rana aurora draytonii). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp

- **No Frogs Scenario:** For timber harvests located within the historic range of the frog but outside of the CNDDB footprint, this analysis conservatively assumes that no frogs will be detected during a frog survey. In this case, CAL FIRE's July 2008 guidance states:

  > "If the [frog] is not present on site nor within the biological assessment area, then timber operations should not cause harassment within aquatic and upland areas."[127]

  Accordingly, under this scenario, landowners are required to highlight protections for aquatic and riparian habitat included in their THP; however, no specific frog conservation measures are required.[128]

- **Outside of Frog Range Scenario:** For timber harvests located outside of the current and historic ranges of the frog, CAL FIRE does not normally require any frog conservation measures on the part of the landowner.[129]

Exhibits 8-5 and 8-6 detail proposed and ongoing timber harvests on private timberland under each of these three scenarios.

[127] California Department of Forestry and Fire Protection. 2008. Recommendations for Addressing California Red-Legged Frog Take Avoidance in Timber Harvesting Documents. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php on November 25, 2008.

[128] Written communication with Chris Browder, California Department of Forestry and Fire Protection, December 30, 2008.

[129] Written communication with Chris Browder, California Department of Forestry and Fire Protection, December 30, 2008.

EXHIBIT 8-4 METHODOLGY USED TO DETERMINE WHETHER CONSERVATION MEASURES WILL BE REQUIRED DURING TIMBER HARVEST

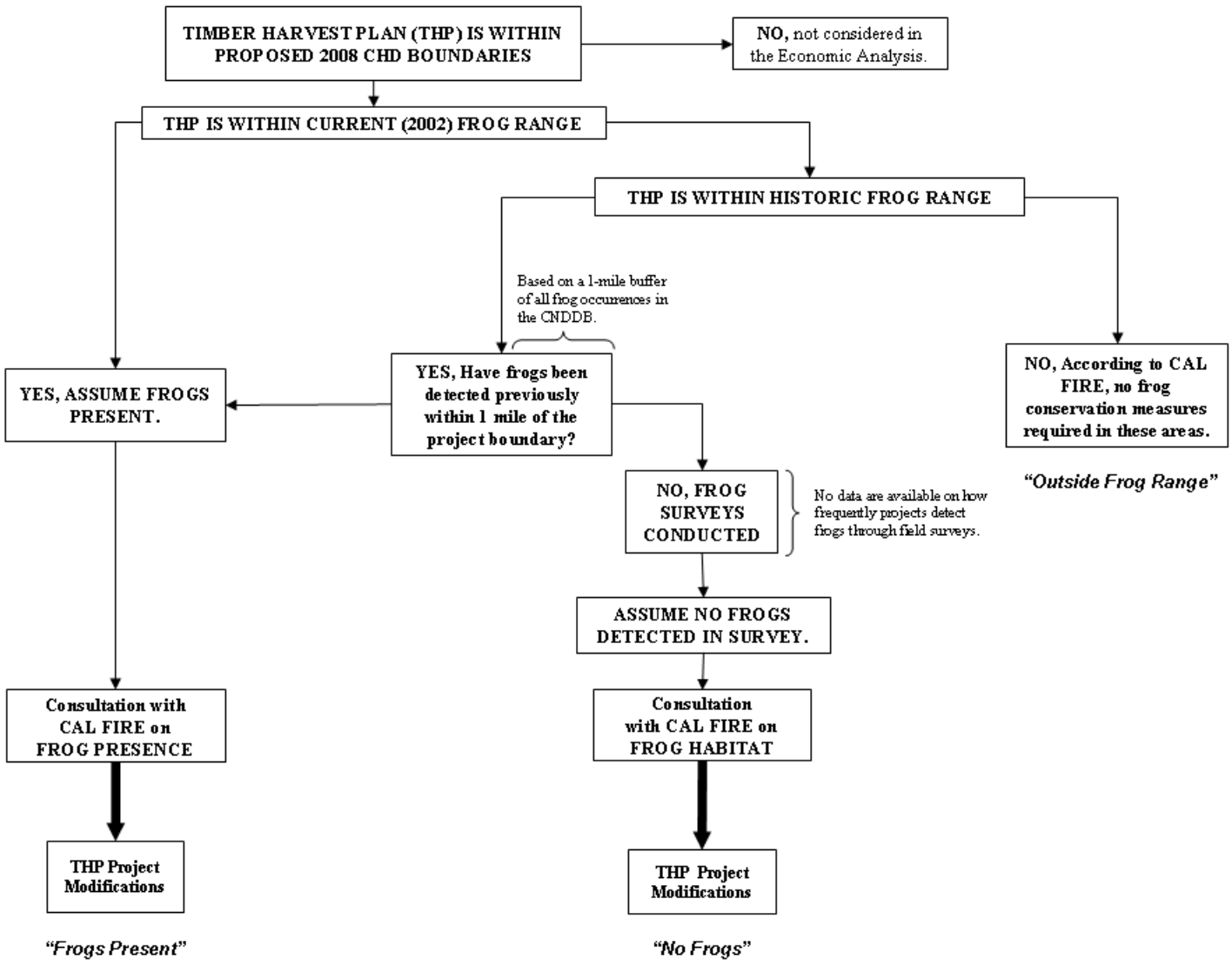

EXHIBIT 8-5 TIMBER HARVEST AREAS ON PRIVATE TIMBERLANDS UNDER EACH POTENTIAL REGULATORY SCENARIO

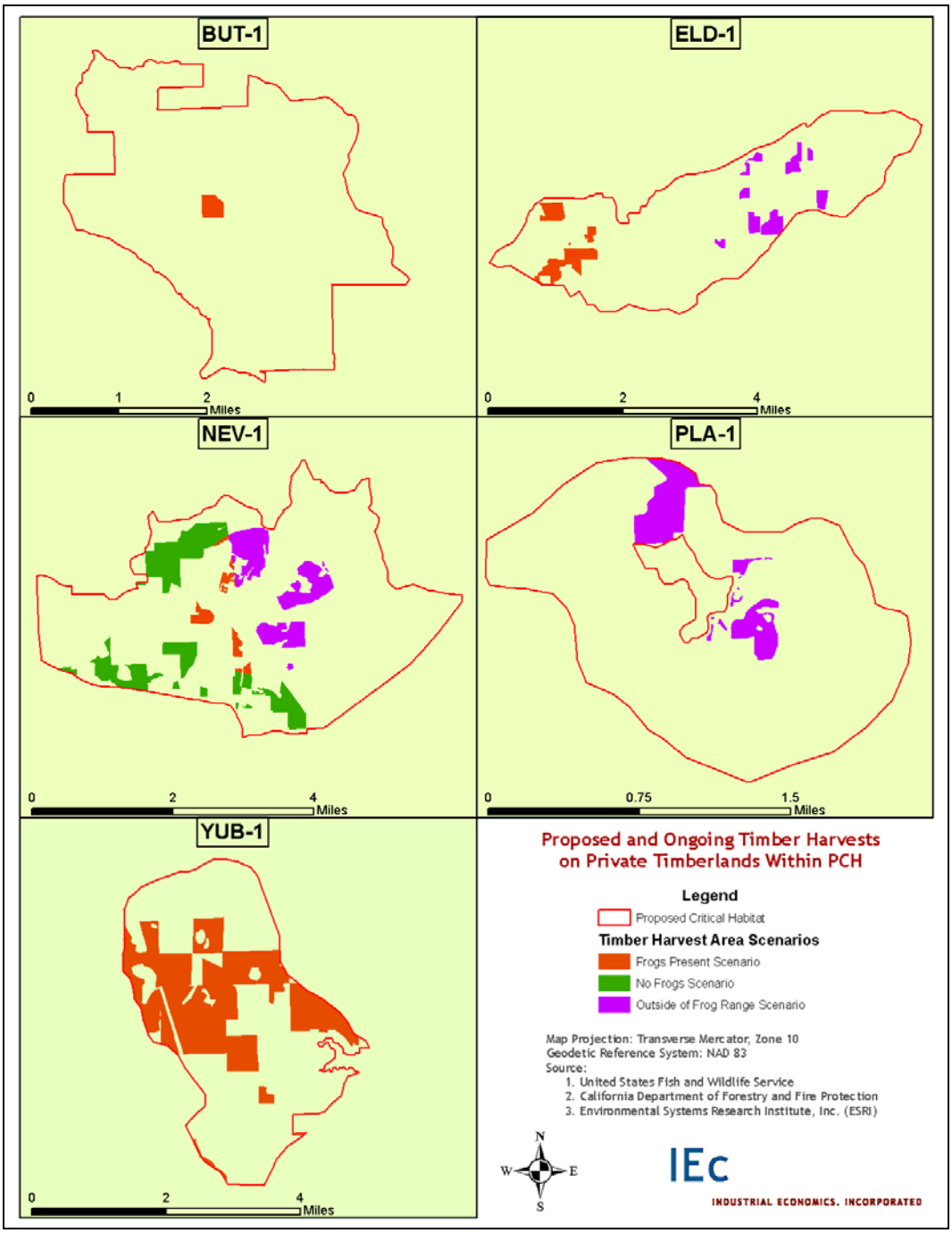

EXHIBIT 8-6 TIMBER HARVEST AREAS ON PRIVATE TIMBERLANDS UNDER EACH POTENTIAL REGULATORY SCENARIO

UNIT	TIMBER HARVEST AREAS BY SCENARIO			TOTAL TIMBER HARVEST AREA
	FROGS PRESENT	NO FROGS	OUTSIDE OF FROG RANGE	
BUT-1	1,000	0	0	1,000
ELD-1	212	0	213	424
NEV-1	115	837	494	1,450
PLA-1	0	0	82	82
YUB-1	2,120	0	0	2,120
Total	**3,450**	**837**	**789**	**5,070**

Sources:
1.) Maps of the current and historic range of the frog by county at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php
2.) CNDDB GIS data obtained from the U.S. Fish and Wildlife Service.
3.) California Department of Forestry and Fire Protection. 2008. Timber Harvest Plan GIS Data for Butte, Eldorado, Nevada, Placer, and Yuba Counties. Accessed online at: ftp://ftp.fire.ca.gov/forest/ on December 22, 2008.

Step 2: Determine Frog-Specific Conservation Measures Required During Timber Harvest Activities

153. Private timberland owners and CAL FIRE determine the appropriate conservation measures to implement during a given timber harvest by considering the size, extent, and location of the timber harvest. Exhibit 8-7 details the conservation measures required for timber harvests occurring at different times of the year and in different locations in relation to suitable habitat for the frog.[130]

154. Several conservation measures are required of all timber harvests where frogs are assumed to be present and when suitable habitat for the frog is located within two miles of the timber harvest area, including:[131]

- Pile burning cannot occur within 300 feet of suitable habitat.
- No herbicide use allowed within 300 feet of suitable habitat except for direct application to stumps.
- If constructing new roads and landings, they must be located 300 feet from suitable habitat and can only be constructed during the dry season.

[130] Landowners are allowed to develop their own site-specific conservation measures for the frog and its habitat, rather than implementing the conservation measures defined by CAL FIRE. Alternatively, a landowner may request technical assistance from the Service, in order to determine the specific conservation measures necessary to adequately protect the frog and its habitat. However, the Service may deny a landowner's request for technical assistance if they are inundated with section 7 consultations. Thus, CAL FIRE recommends landowners adopt the conservation measures developed by CAL FIRE in conjunction with the Service or develop their own measures independently.

[131] U.S. Fish and Wildlife Service. 2008. California Red Legged Frog Take Avoidance Scenarios. U.S. Department of the Interior, Fish and Wildlife Service. Sacramento, California. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php on November 25, 2008.

- Water drafting from suitable habitat must be done with a hose placed in a bucket in a deep pool. The bucket must be covered by < 1 inch mesh, and the mouth of the hose must be covered by quarter inch mesh.

155. Additionally, the Service provides guidance to Cal FIRE on the types of conservation measures that should be included in THPs depending on the type of habitat (aquatic, riparian, or upland) present within the timber harvest area. The additional measures suggested by the Service are summarized as follows:[132]

Aquatic Habitat

- Implement erosion control measures as necessary to prevent sediment movement into aquatic habitat;
- Use road rocking with the WLPZ;
- Mulch or slash pack tractor roads, cable roads, and skid trails in the WLPZ;
- Mulch or slash pack all areas of exposed mineral soil that may contribute sediment movement into aquatic habitat;
- Establish road maintenance programs that provide permanent protection from sediment movement into aquatic habitat; and
- If the likelihood of take of the frog is high, plan all timber harvest activities to occur during the dry season.

Riparian Habitat

- Pile slash outside of riparian habitat, including springs, seeps, bogs, and any other wet areas;
- Use directional felling to avoid damaging riparian habitat; and
- If the likelihood of take of the frog is high, plan all timber harvest activities to occur during the dry season.

Upland Habitat

- All off-road driving and ground disturbing construction-related activities—including road construction, skid trail construction, and construction of landings—should occur during the dry season;
- All yarding and skidding activities should occur during the dry season;
- If implementing a selective harvest, trees should be felled by hand during the wet season;
- If implementing a clearcut, no timber harvest should occur during the wet season;

[132] U.S. Fish and Wildlife Service. 1996. Interim Guidelines for Determining Protective Measures for Timber Harvest Plans to Avoid Take of the California Red-legged Frog. U.S. Department of the Interior, Fish and Wildlife Service. Sacramento, California.

- During the wet season, hauling and loading of logs should occur during daylight hours only; and
- If the likelihood of take of the frog is high, plan all timber harvest activities to occur during the dry season.

As previously described, the CFPR includes guidelines addressing watercourse and lake protection during timber harvest activities in and around aquatic and riparian habitats. Such guidelines are very similar to the frog conservation measures required by CAL FIRE.

EXHIBIT 8-7 FROG CONSERVATION MEASURES REQUIRED DEPENDING ON THE TIMING AND LOCATION OF TIMBER HARVESTS

CONSERVATION MEASURES	HARVEST AREA DESCRIPTION						
	NO SUITABLE HABITAT WITHIN TWO MILES OF HARVEST AREA	SUITABLE HABITAT WITHIN TWO MILES OF HARVEST AREA, BUT NO HARVEST PLANNED WITHIN 300 FEET OF SUITABLE HABITAT	WITHIN TWO MILES OF SUITABLE HABITAT AND HARVEST PLANNED WITHIN 300 FEET OF SUITABLE HABITAT DURING THE WET SEASON				WITHIN TWO MILES OF SUITABLE HABITAT AND HARVEST PLANNED WITHIN 300 FEET OF SUITABLE HABITAT DURING THE DRY SEASON
			WATER CLASS I	WATER CLASS II	WATER CLASS III	WATER CLASS IV	
Maintain a 30-foot no harvest and no equipment buffer around suitable habitat. Fell trees away from suitable habitat.	No specific conservation measures required for the frog or its habitat.				✓	No specific conservation measures required for the frog or its habitat.	✓
Where water is present maintain a 300-foot no harvest buffer around suitable habitat; where dry, maintain a 30-foot no harvest buffer around suitable habitat. No equipment allowed within 75 feet of annual high water mark. Fell trees away form suitable habitat.				✓			
Maintain a 300-foot no harvest and no equipment buffer around suitable habitat.			✓				

Notes:

(1.) Suitable frog habitat is defined as: i) Permanent water greater than 12 inches deep; ii) Permanent water less than 12 inches deep with suitable shelter/cover available (e.g., over-hanging vegetation, emergent vegetation, over-hung branches, etc.); iii) Permanent wet ground with vegetative or other cover; or, iv) Intermittent water that persists through late July.
(2.) The wet season starts with the first frontal rain system depositing a minimum of 0.25 inches of rain after October 15 and ends on April 15. The dry season starts on April 16 and ends with the first frontal rain system…
(3.) Water classes are defined as follows: **Class I**: Domestic water supplies, including springs, onsite and/or within 100 feet downstream of the operations area and/or, those waterbodies where fish are always or seasonally present onsite, including habitat to sustain fish migration and spawning; **Class II**: Those waterbodies where fish are always or seasonally present offsite within 1,000 feet downstream and/or, waterbodies which contain aquatic habitat for non-fish aquatic species; **Class III**: Waterbodies with no aquatic life present, watercourse showing evidence of being capable of sediment transport to Class I and II waters under normal high water flow conditions after completion of timber operations; and, **Class IV**: Man-made watercourses, usually supplying downstream, established domestic, agricultural, hydroelectric supply or other beneficial uses.

Sources:

(1.) U.S. Fish and Wildlife Service. 2008. California Red Legged Frog Take Avoidance Scenarios. U.S. Department of the Interior, Fish and Wildlife Service. Sacramento, California. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php on November 25, 2008.
(2.) California Department of Forestry and Fire Protection. 2008. Recommendations for Addressing California Red-Legged Frog Take Avoidance in Timber Harvesting Documents. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_forestpractice_pubsmemos_memos.php on November 25, 2008.

Step 3: Distinguish between actions resulting from baseline regulations and the proposed critical habitat rule

156. This analysis quantifies baseline impacts associated with conservation measures for the frog that are more stringent than the watercourse and lake protection guidelines included in the CFPR, which are designed to protect "the beneficial uses of water, native aquatic and riparian species, and the beneficial functions of riparian zones" from timber harvest activities.[133] Impacts associated with implementing frog conservation measures, that are equivalent to the CFPR watercourse and lake protection guidelines, are not quantified because such measures would occur even in the absence of the frog or its habitat.

157. Given that the frog conservation measures required by CAL FIRE for timber harvests on private lands (outlined in step 2, above) are designed to protect suitable frog habitat, as well as individual frogs, no additional conservation measures are expected to be required to prevent the adverse modification of critical habitat within the current or historic range of the frog, regardless of frog presence. Furthermore, CAL FIRE does not expect to require specific conservation measures for the frog during timber harvests that are outside of the current and historic frog range, but within critical habitat designated for the frog. Therefore, the incremental impacts of critical habitat designation on private timberlands are forecast to be limited to the administrative costs of section 7 consultation.[134]

Step 4: Estimate Impacts

158. This analysis estimates the administrative costs of participating in consultations addressing the effects of timber harvest projects on the frog through personal communication with CAL FIRE and by using the consultation cost model presented in Chapter 2. Additional baseline impacts on private timberland owners implementing timber harvests within the current or historic ranges for the frog are considered likely.[135] Such impacts are related to the following:

- The installment of buffer areas for the frog larger than the WLPZ buffer areas required under the CFPR;
- More stringent regulations on timber harvest activities within buffer areas (e.g., no timber harvest allowed within 300 feet of suitable frog habitat); and
- The suspension of timber harvest activities during the wet season.

Despite several attempts to reach private timberland owners in order to estimate additional baseline impacts associated with frog conservation, currently, there is not enough information to quantify project modification impacts on commercial timber harvests on private timberlands in the study area. Additional data and/or information are

[133] California Department of Forestry and Fire Protection. 2008. California Forest Practice Rules 2008. Title 14, California Code of Regulations: Chapters 4, 4.5, and 10. California Department of Forestry and Fire Protection, Resource Management, Forest Practice Program. Sacramento, California.

[134] Written communication with Chris Browder, California Department of Forestry and Fire Protection, December 30, 2008.

[135] Based on preliminary communication with Stevan Andrews, Manager, Applied Forest Management on January 6, 2009.

invited on future timber harvest projects on private timberlands and the potential economic impacts due to frog conservation. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

8.4 IMPACTS

159. This section presents pre-designation, post-designation baseline, and post-designation incremental impacts on timber harvest activities by unit for the five critical habitat units where timber harvest activities are identified as a threat to the frog and its habitat.

Pre-Designation Impacts

160. Pre-designation impacts on timber harvest activities have been incurred by CAL FIRE and the USFS. Impacts on CAL FIRE stem from the review of THPs for timber harvests on private timberlands within the study area (approximately $50 since 1996, undiscounted) and from implementing measures to avoid take of the frog on State lands (approximately $49,400 since 1996, undiscounted).[136,137] Impacts on the USFS are due to the administrative costs of section 7 consultation (approximately $36,200 since 1996, undiscounted). Exhibit 8-8 presents pre-designation impacts by unit.

EXHIBIT 8-8 PRE-DESIGNATION IMPACTS ON TIMBER HARVEST ACTIVITIES BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS
BUT-1	$85,800
ELD-1	$7,300
NEV-1	$20,300
PLA-1	$7,140
YUB-1	$10,500
Total	**$131,000**

Post-Designation Baseline Impacts

161. Post-designation baseline impacts are forecast to be incurred by CAL FIRE and the USFS. Impacts to CAL FIRE are due to future reviews of THPs for timber harvests on private timberlands (approximately $50 annually, undiscounted) and the future implementation of measures to avoid take of the frog on State lands (approximately $3,800 annually, undiscounted). Impacts to the USFS are due to future administrative

[136] Written communication with Chris Browder, California Department of Forestry and Fire Protection, January 9, 2009.

[137] Estimates of impacts related the avoidance of take of the frog on State lands were provided for State lands across both the current and historic frog ranges. Such estimates could not be reduced to impacts incurred within the study area only. Thus, this analysis conservatively assumes that all take avoidance measures implemented on State lands occurred or will occur within the study area.

costs of consultation for the frog (approximately $2,790 annually, undiscounted). Exhibit 8-9 presents post-designation baseline impacts by unit.

EXHIBIT 8-9 POST-DESIGNATION BASELINE IMPACTS ON TIMBER HARVEST ACTIVITIES BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
BUT-1	$47,500	$4,290
ELD-1	$4,150	$375
NEV-1	$11,500	$1,040
PLA-1	$4,040	$365
YUB-1	$6,220	$563
Total	**$73,400**	**$6,630**

Post-Designation Incremental Impacts

162. All post-designation incremental impacts are forecast to be incurred by the USFS. The impacts stem from the administrative costs of addressing adverse modification of critical habitat during baseline section 7 consultation for the frog (i.e., consultations that occur because of the species listing, not the designation of critical habitat). Exhibit 8-10 presents post-designation incremental impacts by unit.

EXHIBIT 8-10 POST-DESIGNATION INCREMENTAL IMPACTS ON TIMBER HARVEST ACTIVITIES BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
BUT-1	$2,570	$232
ELD-1	$1,380	$125
NEV-1	$3,010	$272
PLA-1	$1,350	$122
YUB-1	$1,980	$179
Total	**$10,300**	**$930**

8.5 ASSUMPTIONS & CAVEATS

163. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data. In several cases, data have been requested from stakeholders but has not been forthcoming. Total impact estimates may increase as information becomes available. Other major assumptions and caveats applied in the analysis of impacts to timber harvest activities are summarized in Exhibit 8-11.

EXHIBIT 8-11 SUMMARY OF ASSUMPTIONS & CAVEATS USED IN TIMBER HARVEST ACTIVITIES ANALYSIS

ASSUMPTION/CAVEAT	POTENTIAL EFFECT ON RESULTS
Analysis only estimates impacts on timber harvest activities within the five units where timber harvest activities are identified as a threat to the frog (i.e., BUT-1, ELD-1, NEV-1, PLA-1, and YUB-1).	-
If CAL FIRE were to require additional frog conservation measures for timber harvests occurring within critical habitat in the future, there would be additional incremental impacts.	+
Analysis assumes that any timber harvest area located within proposed critical habitat for the frog will include suitable habitat for the frog.	+
Additional baseline impacts are considered likely on timber harvests on private timberlands. Currently, there is not enough information to quantify such impacts in this analysis.	-
Analysis assumes that all frog take avoidance measures implemented by CAL FIRE on State lands occurred or will occur within the study area.	+
+: This assumption may result in an overestimate of real costs. - : This assumption may result in an underestimate of real costs. +/-: This assumption has an unknown effect on estimates.	

CHAPTER 9 | TRANSPORTATION

164. This chapter describes how conservation efforts to protect the frog and its habitat may affect transportation activities in the study area. These activities represent a potential threat to the species and its habitat by reducing available aquatic habitat through siltation or direct removal of upland habitat. Transportation activities may also pose risks of habitat fragmentation because roads and thruways can produce a physical barrier between habitat areas.[138]

165. The California Department of Transportation (Caltrans) maintains and builds highways as well as railroads and mass transit lines for the State of California. Most road projects planned and carried out by Caltrans involve a Federal nexus through funding from the Federal Highway Administration (FHWA) or from permits required under Section 404 of the Clean Water Act (CWA).

166. Exhibit 9-1 provides an overall summary of impacts to transportation activities as described in the remainder of the chapter. Conservation measures required for transportation-related activities to protect the frog are primarily designed to preserve water quality and minimize surface disturbance. For larger transportation projects, Caltrans may also purchase land from conservation banks to offset direct habitat loss. Additionally, where suitable frog habitat is present, Caltrans will survey and monitor for the frog. Aside from these offset purchases and monitoring/survey efforts, these conservation measures are expected to occur even in the absence of the frog and its habitat as a result of existing best management practices. Based on the level of existing measures to protect frog habitat, the incremental impacts of critical habitat designation are forecast to be relatively minor and administrative.

167. The chapter begins by discussing past and likely future transportation-related impacts within the study area, Caltrans' frog site assessment procedures, and past frog conservation measures for transportation-related activities. This is followed by a presentation of pre- and post-designation impacts and a final section highlighting major assumptions and caveats of the analysis.

[138] 73 FR 53511.

EXHIBIT 9-1 SUMMARY OF IMPACTS TO TRANSPORTATION ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

VALUES	LOW	HIGH
Pre-Designation Impacts (1996 – 2008)		
Present Value of Impacts	$2,380,000	$7,300,000
Post-Designation Baseline Impacts (2009 – 2030)		
Present Value of Impacts	$657,000	$2,100,000
Annualized Impact Value	$59,400	$190,000
Incremental Impacts (2009 – 2030)		
Present Value of Impacts	$25,400	$25,400
Annualized Impact Value	$2,300	$2,300

9.1 BACKGROUND

9.1.1 TRANSPORTATION ACTIVITIES IN THE STUDY AREA

168. According to the National Highway Planning Network, approximately 297 miles of the national highway system falls within the study area.[139] Portions of State Highway 1 in units SLO-1 and SLO-2 account for roughly one-third of this mileage.

169. Caltrans maintains a database of current and predicted transportation projects called the California Transportation Investment System (CTIS). CTIS is a GIS-based application created by Caltrans that displays the current location of planned projects, as well as "programmed" (i.e., projects with secured funding) transportation projects until 2030. Exhibit 9-2 presents the major past and forecast transportation projects as determined by an overlay of CTIS projects and the study area.

170. Since 1998, Caltrans has undertaken 35 projects within the study area. Over the next 22 years, 9 projects are planned or programmed within the study area. Both past and forecast projects range in scope but primarily involve bridge replacements, construction of additional lanes, and other improvements to roadways and roadsides. Projects slated to be built beyond 2012 (the time horizon for the current State Transportation Improvement Program[140]) will ultimately depend on funding availability. Projects in CTIS represent Caltrans current priorities with respect to prevailing road conditions and funding forecasts.

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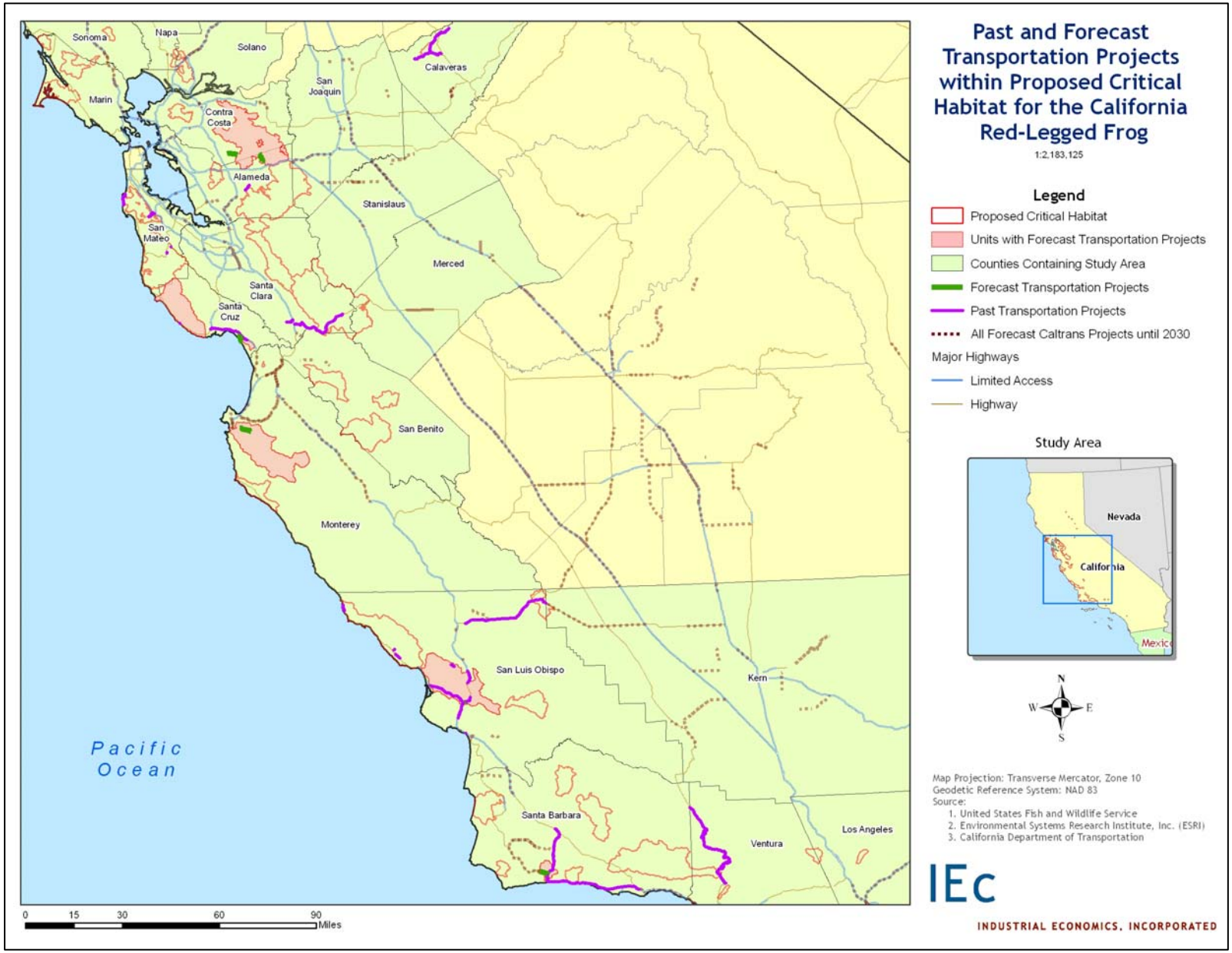
[139] The Federal Highway Administration, National Highway Planning Network (computer file). 2005. District of Columbia. Accessed at: http://www.fhwa.dot.gov/planning/nhpn/ on January 2, 2009.

[140] The State Transportation Improvement Program (STIP) is a multi-year capital improvement program of transportation projects on and off the State Highway System, funded with revenues from the State Highway Account and other funding sources. STIP programming generally occurs every two years. For more information, see http://www.dot.ca.gov/hq/LocalPrograms/STIP.htm

EXHIBIT 9-2 PAST AND FORECAST TRANSPORTATION PROJECTS IN THE STUDY AREA



9.1.2 CALTRANS SITE ASSESSMENT PROCEDURES

171. Caltrans considers the presence of endangered species on all projects. If Caltrans biologists detect suitable habitat for the frog and the species is known to exist in the project area, they will survey for the species. If suitable habitat is present but the species' presence cannot be confirmed by known occurrences, Caltrans will follow the Service's guidance on site field surveys. Whether through an initial Caltrans survey or Service survey protocol, if frog presence is established or suitable habitat is identified, Caltrans will undertake protective measures for the species.[141]

9.1.3 FROG CONSERVATION MEASURES

172. Since the species listing in 1996, there have been 73 section 7 consultations associated with transportation-related activities. Conservation measures required for transportation-related activities are primarily designed to preserve water quality and minimize surface disturbance. Accordingly, the majority of conservation measures required to protect the frog or its habitat are expected to occur even in the absence of the frog and its habitat as part of existing regional Flood Control District permits or as Caltrans Best Management Practices (BMPs).[142] According to discussions with Caltrans staff, frog-specific conservation measures are limited to:

- Pre-construction survey, capture and removal of any frogs by qualified biologists;
- Construction confined to the dry season;[143]
- In areas temporarily disturbed, vegetation will be removed by hand, where feasible, instead of by heavy equipment;[144]
- No water will be used from streams or ponds that support the frog;
- Construction of temporary silt dams to minimize sedimentation; and
- Hydroseed project areas to stabilize soils prior to the onset of winter rains upon project completion.

173. In addition to the above construction-based conservation measures, Caltrans has purchased habitat, conservation easements, or established in-lieu fee mitigation programs to offset impacts from the agency's larger transportation projects. In 2007, Caltrans spent a total of $1.49 million on conservation bank acquisitions. Caltrans staff estimates

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[141] Personal communication with Tom Edell, Associate Biologist at Caltrans (District 5) on December 10, 2008.

[142] Ibid.; Caltrans Storm Water Quality Handbooks: Project Planning and Design Guide. Construction Site Best Management Practices Manual. March 1, 2003. Accessed at http://www.dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf on December 29, 2008.

[143] Estimating impacts on past modifications such as confining construction to the dry season or removing vegetation by hand is difficult. Caltrans schedules a majority of their large projects in the dry season and impacts associated with seasonal restrictions can typically be mitigated with advanced planning, resulting in negligible impacts. Also, quantifying the additional burden of removing vegetation by hand or minimizing ground disturbance varies by project and does not represent a significant additional cost.

[144] Supra note 222.

roughly one-third of this cost was directly related to frog-specific acquisitions, while other transactions included the frog among other species. [145]

174. Caltrans provided cost data for frog conservation measures from 10 projects in 2007. Exhibit 9-3 summarizes these estimated frog conservation costs associated with transportation-related activities.

EXHIBIT 9-3 EXAMPLE FROG CONSERVATION COSTS FOR TRANSPORTATION ACTIVITIES (2007)

ESTIMATED BANK CREDITS, IN-LIEU, CONSERVATION EASEMENTS, AND COOP AGREEMENTS FOR THE FROG		AVOIDANCE & MINIMIZATION		CREATION & RESTORATION		MONITORING		TOTAL PROJECT COST	
LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
$53,000	$159,000	$0	$9,750	$25,000	$80,000	$5,000	$50,000	**$83,000**	**$299,000**

Note: Cost data taken from Caltrans Endangered Species Act Annual Impact and Mitigation Report. The listed figures represent ranges in per-project costs, where such ranges existed. The data is only representative of the sample of 2007 projects.

9.2 PRE-DESIGNATION BASELINE IMPACTS

175. The pre-designation period for this analysis extends from the listing of the species in 1996 to 2008. Exhibit 9-4 presents total undiscounted and present value costs of pre-designation frog management activities on transportation-related activities. All 24 past projects required a Biological Opinion and fell within the study area between 2003 and 2008. To estimate pre-designation impacts, this analysis applies the range of costs listed in Exhibit 9-3 to the year in which the project occurred (as well as administrative costs of formal consultations highlighted in Exhibit 2-2).

[145] California Department of Transportation. Endangered Species Act Annual Impact and Mitigation Report Submittal. Forwarded by Amy Pettler, Senior Endangered Species Coordinator and Wildlife Biologist, Division of Environmental Analysis on January 5, 2009. Only about one-third of the conservation bank acquisitions were attributable solely to the frog. Most purchases included mitigation lands for multiple species, which included the frog.

EXHIBIT 9-4 TRANSPORTATION PRE-DESIGNATION ECONOMIC IMPACTS (1996- 2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	TOTAL NUMBER OF PROJECTS	YEARS	PRESENT VALUE COST	
			LOW	HIGH
MNT-2	1	2005	$102,000	$366,000
MNT-3	1	2006	$95,000	$342,000
SCZ-1	1	2008	$83,000	$299,000
SCZ-2	1	2003	$116,000	$419,000
SLO-1	2	2005	$203,000	$732,000
SLO-2	7	2004, 2006, 2007	$674,000	$1,470,000
SLO-3	2	2005, 2006	$197,000	$708,000
SNB-1	2	2003, 2006	$211,000	$761,000
SNB-3	1	2004	$109,000	$392,000
STB-4	1	2004	$109,000	$392,000
STB-5	3	2005, 2007	$292,000	$732,000
VEN-1	2	2004, 2008	$192,000	$691,000
Total	**24**		**$2,380,000**	**$7,300,000**

9.3 POST-DESIGNATION IMPACTS

176. The post-designation period for this analysis is 2009 to 2030. Based on Caltrans data, nine transportation projects are expected to occur between 2009 and 2030. Of these, three projects are expected to begin in 2009, three in 2010, one in 2011, and two in 2030. As previously discussed, based on discussions with Caltrans staff, conservation measures are implemented for all projects where frog presence is established or suitable habitat is identified. Because this analysis assumes the entire study area contains suitable habitat, frog-specific conservation measures required for transportation activities are expected to occur even in the absence of the frog. Therefore, this analysis assumes that the only incremental impacts are administrative in nature. Post-designation impacts are categorized as either occurring in the baseline or as incremental to the proposed critical habitat designation. Exhibit 9-5 summarizes the post-designation baseline impacts and Exhibit 9-6 presents post-designation incremental impacts.

EXHIBIT 9-5 TRANSPORTATION POST-DESIGNATION BASELINE ECONOMIC IMPACTS (2009 – 2030, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST		ANNUALIZED COST	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
CCS-2	$196,000	$628,000	$178,000	$568,000	$16,100	$51,300
MNT-2	$295,000	$942,000	$263,000	$842,000	$23,800	$76,100
SCZ-1	$98,200	$314,000	$22,200	$70,900	$2,000	$6,410
SCZ-2	$98,200	$314,000	$22,200	$70,900	$2,000	$6,410
SLO-3	$98,200	$314,000	$91,800	$294,000	$8,300	$26,500
STB-5	$98,200	$314,000	$80,200	$256,000	$7,250	$23,200
Total	**$884,000**	**$2,830,000**	**$657,000**	**$2,100,000**	**$59,400**	**$190,000**

Note: Totals may not sum due to rounding.

EXHIBIT 9-6 TRANSPORTATION POST-DESIGNATION INCREMENTAL ECONOMIC IMPACTS (2009 – 2030, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST		ANNUALIZED COST	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
CCS-2	$7,600	$7,600	$6,870	$6,870	$621	$621
MNT-2	$11,400	$11,400	$10,200	$10,200	$921	$921
SCZ-1	$3,800	$3,800	$858	$858	$78	$78
SCZ-2	$3,800	$3,800	$858	$858	$78	$78
SLO-3	$3,800	$3,800	$3,550	$3,550	$321	$321
STB-5	$3,800	$3,800	$3,100	$3,100	$280	$280
Total	**$34,200**	**$34,200**	**$25,400**	**$25,400**	**$2,300**	**$2,300**

Note: Totals may not sum due to rounding.

9.4 SOURCES OF UNCERTAINTY

177. It is important to recognize the uncertainty inherent in the assumptions underlying this analysis. Exhibit 9-6 summarizes these uncertainties and their potential effect on estimated economic impacts.

EXHIBIT 9-6 SUMMARY OF SOURCES OF UNCERTAINTY TO TRANSPORTATION ANALYSIS

ASSUMPTION	POTENTIAL EFFECT ON RESULTS
Cost data taken from Caltrans Endangered Species Act Annual Impact and Mitigation Report Submittal. The costs listed represent the ranges in cost information, where such ranges existed. The data is only representative of 10 2007 projects.	+/-
The CTIS database includes all planned and programmed transportation projects until 2030. The location of projects beyond those that have already secured funding are subject to change based on funding priorities and road conditions.	+/-
Impacts from conservation measures are incurred throughout the lifetime of the project. Larger transportation projects take many years to complete. For the two projects anticipated to begin in 2030, this analysis applies the full costs of implementing protective measures for the frog in that year.	+
Caltrans Districts interviewed for this analysis do not reference critical habitat boundaries when determining suitable habitat or species presence. This analysis assumes that all forecast projects will include a species survey and range of protective measures outlined in Exhibit 9-3.	+

+: This assumption may result in an overestimate of real costs.
- : This assumption may result in an underestimate of real costs.
+/-: This assumption has an unknown effect on estimates.

CHAPTER 10 | UTILITY AND OIL AND GAS PIPELINE CONSTRUCTION AND MAINTENANCE

178. This chapter evaluates the effect of frog conservation efforts on utility and pipeline construction and maintenance activities in the study area. Similar to transportation activities, these activities represent a potential threat to the species or its habitat by causing siltation and reducing available aquatic habitat or direct removal of upland habitat.[146] Such activities also pose risks of habitat fragmentation.

179. Major utility and pipeline construction and maintenance projects involve a Federal nexus from permits required under Section 404 of the CWA, issued by the U.S. Army Corps of Engineers (USACE). According to the California Energy Commission (CEC), natural gas pipelines intersect 22 of the 50 critical habitat units and petroleum pipelines intersect seven critical habitat units.[147] In addition, three energy facilities fall within the study area.

180. Exhibit 10-1 summarizes the economic impacts to utility and oil and gas pipeline activities. Similar to transportation activities, conservation measures required to protect the frog and its habitat during construction and maintenance activities associated with utility and oil and gas pipelines are primarily designed to preserve water quality and minimize surface disturbance.

181. The remainder of this chapter provides additional detail on development of the impact estimates presented in Exhibit 10-1. To provide context for the analysis, the following section presents the extent of utility and oil & gas pipelines within the study area. The second section describes the data and methods from which the impact estimates are derived. The third section summarizes the projected economic impacts to utility and oil and gas pipeline activities and highlights major assumptions and caveats that may affect the results of the analysis.

[146] 73 FR 53511.

[147] Maps of the overlay of natural gas and petroleum pipelines with proposed critical habitat were produced by the California Energy Commission. Polyline layers delineating the location of pipelines are generalized and accordingly, the overlay with proposed critical habitat is based on a visual approximation.

EXHIBIT 10-1 BASELINE AND INCREMENTAL POTENTIAL IMPACTS OF FROG CRITICAL HABITAT DESIGNATION ON UTILITY AND PIPELINE ACTIVITIES

VALUES	LOW	HIGH
Pre-Designation Impacts (1996 - 2008)		
Present Value of Impacts	$219,000	$1,020,000
Post-Designation Baseline Impacts (2009 - 2030)		
Present Value of Impacts	$624,000	$2,280,000
Annualized Impact Value	$56,500	$206,000
Incremental Impacts (2009 - 2030)		
Present Value of Impacts	$57,300	$57,300
Annualized Impact Value	$5,180	$5,180

10.1 UTILITY AND OIL AND GAS PIPELINES IN CALIFORNIA

182. The extent to which pipelines overlap the study area is difficult to determine because a detailed overlay of existing pipelines within the study area is unavailable due to national security concerns. Exhibits 10-2 and 10-3 provide select extents from maps provided by the CEC for this analysis. Each map provides a general delineation of the location of natural gas and petroleum pipelines within California, and their spatial relation to the study area.

183. As shown in Exhibit 10-4, currently there are three power plants within the study area:

1) **Stenner Canyon Hydroelectric Plant**. The Stenner Canyon facility is currently inactive and the City of San Luis Obispo has no plans to reactivate the plant in the foreseeable future.[148]

2) **City of Santa Cruz Resource Recovery Facility.** This facility is a landfill gas collection system and electric generation facility. The County of Santa Cruz has no plans to expand or renovate the landfill gas collection system facility over the next 22 years.[149]

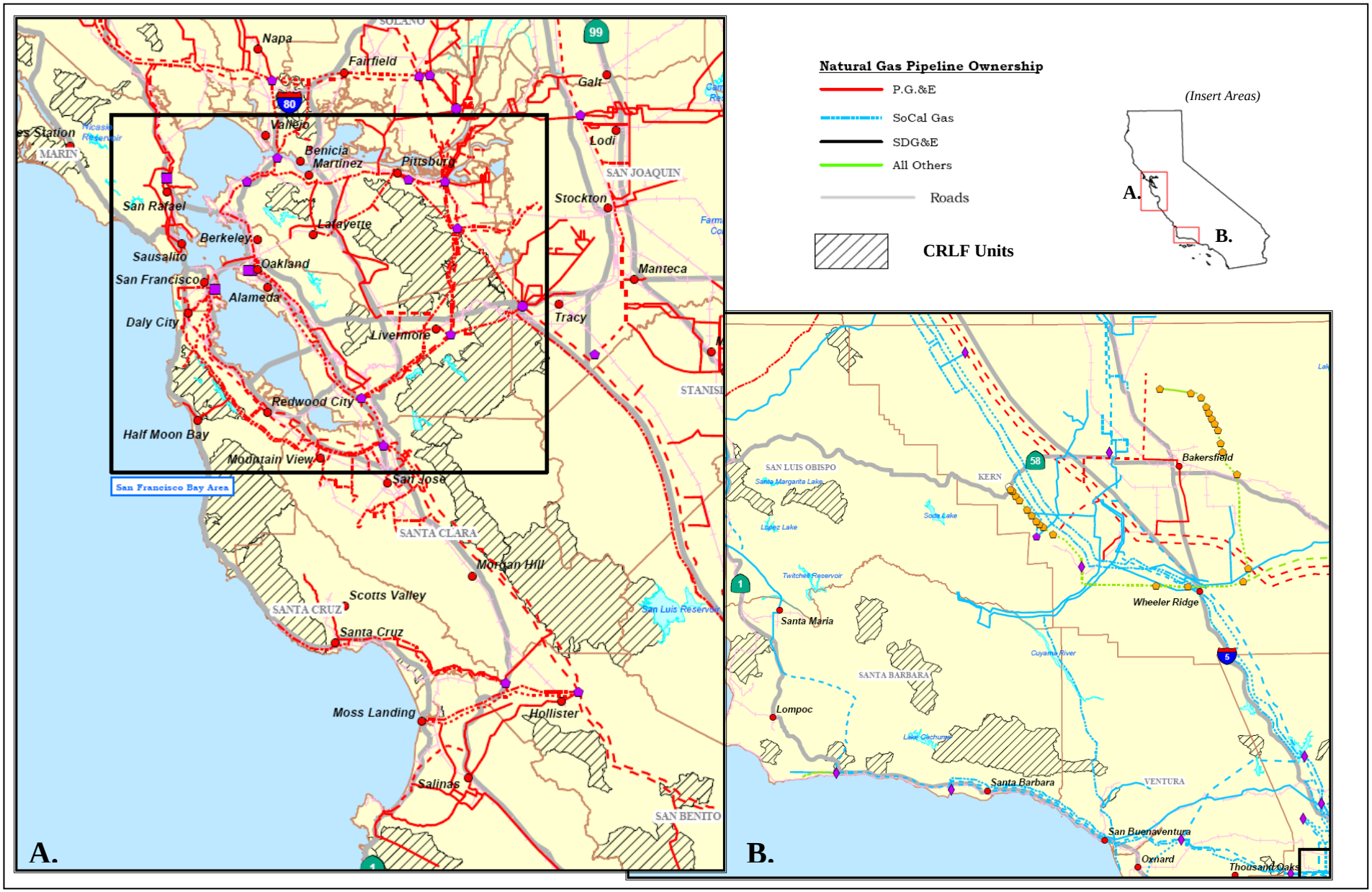
3) **Waste Management – Linde Group Altamont Landfill Gas Plant.** Waste Management and the Linde North America are planning the largest landfill gas plant in the world at the current Altamont Landfill near Livermore, California. The $15.5 million facility is expected to produce up to 13,000 gallons a day of liquefied natural gas when operations begin in 2009.[150] As highlighted in Exhibit 10-4, the plant is located in Unit ALA-2.

[148] Personal communication with Gary Henderson, Manager of Water Division in the Department of Public Utilities for the City of San Luis Obispo on January 12, 2009.

[149] Personal communication with Mary Arman, Public Works Operations Manager-Resource Recovery & Administrative Services, City of Santa Cruz on January 12, 2009.

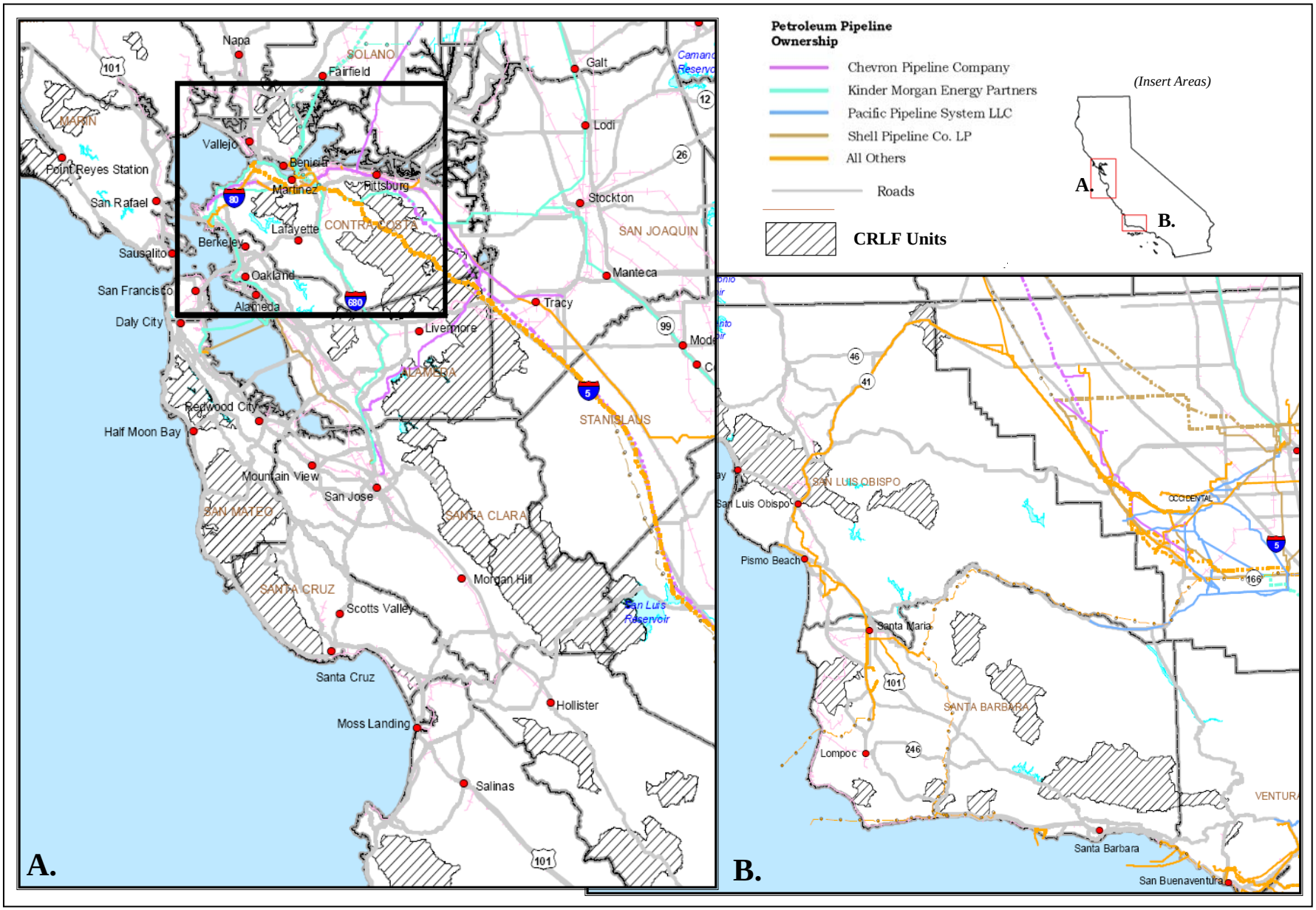
[150] Waste Management Press Release- April 29, 2008. Waste Management And Linde To Develop The World's Largest Landfill Gas To LNG Facility. Available at: http://www.wm.com/wm/environews.asp, accessed on January 13, 2009.

EXHIBIT 10-2 SELECT EXTENTS OF NATURAL GAS PIPELINE LOCATIONS IN THE STUDY AREA



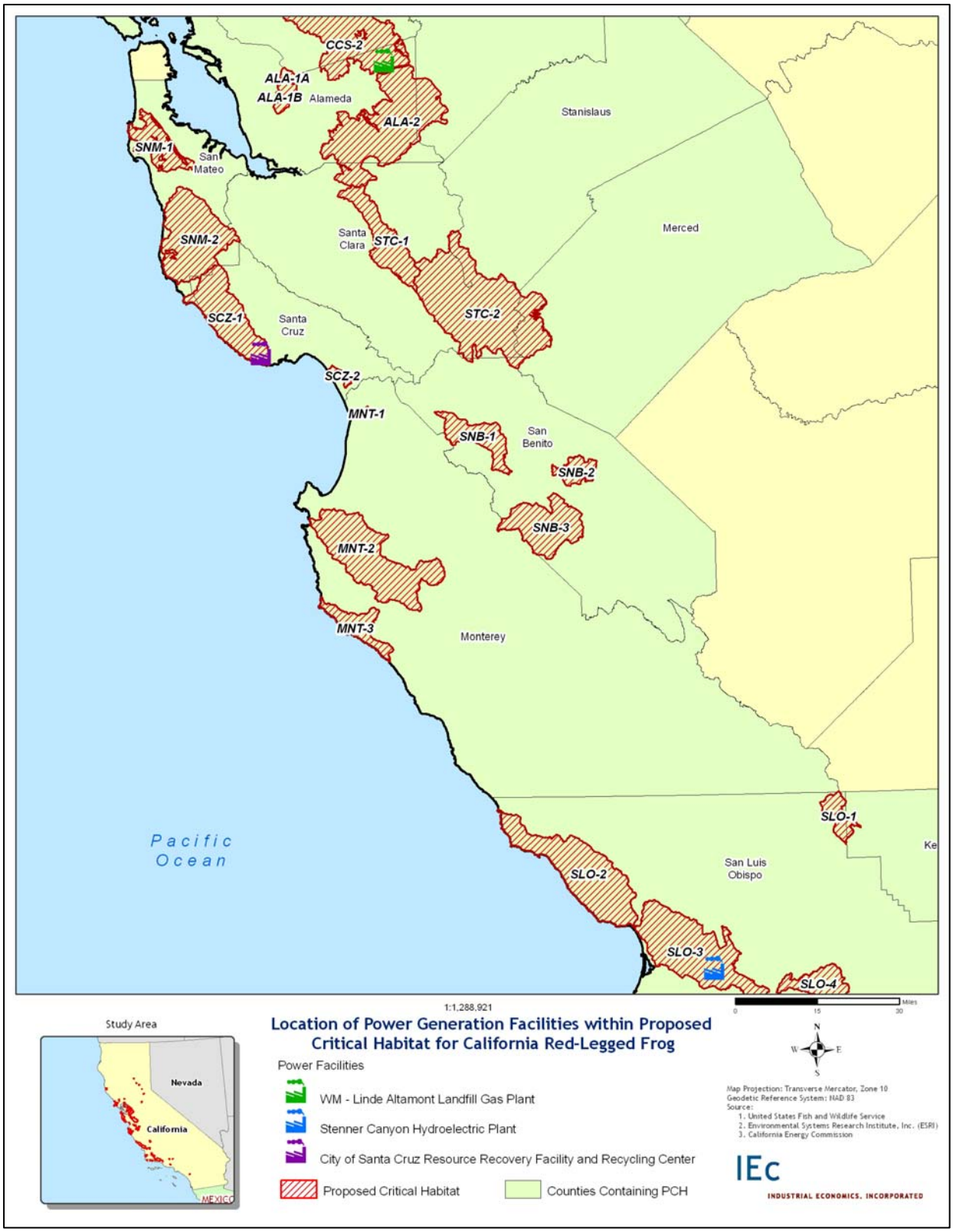
Source: California Energy Commission

EXHIBIT 10-3 SELECT EXTENTS OF PETROLEUM PIPELINE LOCATIONS IN THE STUDY AREA



Source: California Energy Commission

EXHIBIT 10-4 POWER PLANTS WITHIN THE STUDY AREA



10.2 PRE-DESIGNATION BASELINE IMPACTS

184. Since the species listing in 1996, there have been 6 section 7 consultations associated with construction and maintenance activities on utility and oil and gas pipelines. Similar to conservation measures required for water management and transportation-related activities, conservation measures required for these pipeline-related activities are primarily designed to preserve water quality and minimize surface disturbance. Based on a review of the consultation history, examples of frog-specific conservation measures include:

- Pre-construction frog surveys and removal of identified frogs;
- Biologist on-site during all activities;
- Worker education and training session;
- Revegetate and re-contour all disturbed areas with native vegetation;
- Construction work limited to the dry season (May 1 through Oct 31) and/or low stream flow periods (June 1 through Nov 1);
- Construction equipment, staging areas, fueling and maintenance vehicles will be located outside of riparian and wetland areas; and
- Establishment of buffer zones around off-site parking areas.

Cost data requested from oil and gas stakeholders have not been forthcoming. However, given the similarity in conservation measures required for pipeline projects and transportation projects, this analysis applies relevant cost information obtained from Caltrans for transportation projects (Exhibit 10-5) to estimate past projects impacts (Exhibit 10-6).

EXHIBIT 10-5 FROG CONSERVATION COSTS FOR PIPELINE AND UTILITY ACTIVITIES (2007)

AVOIDANCE & MINIMIZATION		HABITAT CREATION & RESTORATION		MONITORING		TOTAL PROJECT COST	
LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
$0	$9,750	$25,000	$80,000	$5,000	$50,000	**$30,000**	**$140,000**

Source: California Department of Transportation. 2007. Endangered Species Act Annual Impact and Mitigation Report Submittal. Division of Environmental Analysis.
Note: Totals may not sum due to rounding.

EXHIBIT 10-6 PRE-DESIGNATION IMPACTS (1996 - 2008, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	NUMBER OF PROJECTS	PROJECT YEARS	PRESENT VALUE COST	
			LOW	HIGH
STB-4	1	2007	$42,100	$196,000
STB-5	2	2004, 2005	$76,100	$354,000
SLO-3	1	2007	$36,800	$171,000
STB-7	1	2003	$32,100	$150,000
ALA-2	1	2005	$32,100	$150,000
Total	**6**		**$219,000**	**$1,020,000**
Note: Totals may not sum due to rounding.				

10.3 POST-DESIGNATION IMPACTS

185. As previously discussed, a detailed overlay of existing pipeline within the study area is unavailable due to national security concerns. This analysis used customized maps produced by the CEC to estimate the location of natural gas and petroleum pipelines. Based on a visual inspection of pipelines in the study area, there are 22 natural gas and seven petroleum pipelines course though the study area. Based on a review of the consultation history, this analysis conservatively assumes that each pipeline will be subject to maintenance or repairs over the next 22 years. Additionally, of the three existing power plants in the study area, one facility is currently undertaking a major expansion.

186. Based on this information, this analysis estimates a total of 29 construction and maintenance projects to occur within the study area over the next 22 years. Absent specific information on when the project will occur, this analysis assumes there is an equal probability of a project happening between 2009 and 2030. Therefore, this analysis spreads the potential impacts incurred from a project equally across the time horizon for the analysis. Average project modification costs (as shown in Exhibit 10-5) are applied to the number of forecast projects. The total post-designation costs are presented in Exhibit 10-7. This analysis assumes that the only incremental impacts are administrative in nature.

EXHIBIT 10-7 PIPELINE AND UTILITY POST-DESIGNATION BASELINE ECONOMIC IMPACTS (2009 – 2030, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST		ANNUALIZED COST	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-2	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
CCS-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
CCS-2	$124,000	$453,000	$62,400	$228,000	$5,650	$20,600
MNT-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SCZ-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SLO-1	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
SLO-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SLO-3	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
SNB-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SNB-3	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SNM-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SOL-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SOL-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
SOL-3	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
STB-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
STB-5	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
STB-6	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
STB-7	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
STC-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
STC-2	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
VEN-1	$41,400	$151,000	$20,800	$76,000	$1,880	$6,870
VEN-3	$82,800	$302,000	$41,600	$152,000	$3,760	$13,700
Total			**$624,000**	**$2,280,000**	**$56,500**	**$206,000**

Note: Totals may not sum due to rounding.

EXHIBIT 10-7 PIPELINE AND UTILITY POST-DESIGNATION INCREMENTAL ECONOMIC IMPACTS (2009 – 2030, 2008 DOLLARS ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COST		PRESENT VALUE COST		ANNUALIZED COST	
	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-2	$7,600	$7,600	$3,820	$3,820	$345	$345
CCS-1	$3,800	$3,800	$1,910	$1,910	$173	$173
CCS-2	$11,400	$11,400	$5,730	$5,730	$518	$518
MNT-2	$3,800	$3,800	$1,910	$1,910	$173	$173
SCZ-1	$3,800	$3,800	$1,910	$1,910	$173	$173
SLO-1	$7,600	$7,600	$3,820	$3,820	$345	$345
SLO-2	$3,800	$3,800	$1,910	$1,910	$173	$173
SLO-3	$7,600	$7,600	$3,820	$3,820	$345	$345
SNB-2	$3,800	$3,800	$1,910	$1,910	$173	$173
SNB-3	$3,800	$3,800	$1,910	$1,910	$173	$173
SNM-1	$3,800	$3,800	$1,910	$1,910	$173	$173
SOL-1	$3,800	$3,800	$1,910	$1,910	$173	$173
SOL-2	$3,800	$3,800	$1,910	$1,910	$173	$173
SOL-3	$3,800	$3,800	$1,910	$1,910	$173	$173
STB-2	$3,800	$3,800	$1,910	$1,910	$173	$173
STB-5	$7,600	$7,600	$3,820	$3,820	$345	$345
STB-6	$7,600	$7,600	$3,820	$3,820	$345	$345
STB-7	$3,800	$3,800	$1,910	$1,910	$173	$173
STC-1	$3,800	$3,800	$1,910	$1,910	$173	$173
STC-2	$3,800	$3,800	$1,910	$1,910	$173	$173
VEN-1	$3,800	$3,800	$1,910	$1,910	$173	$173
VEN-3	$7,600	$7,600	$3,820	$3,820	$345	$345
Total			**$57,300**	**$57,300**	**$5,180**	**$5,180**

Note: Totals may not sum due to rounding.

10.4 SOURCES OF UNCERTAINTY

187. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data and the difficulty of forecasting future projects in the study area. In several cases, data have been requested from stakeholders but has not been forthcoming. To the extent that future projects were not identified, total impact estimates may increase as information becomes available.

EXHIBIT 10-8 SUMMARY OF CAVEATS TO UTILITY AND OIL AND GAS PIPELINE ANALYSIS

ASSUMPTION	POTENTIAL EFFECT ON RESULTS
Due to national security concerns, the exact locations of natural gas and petroleum pipelines are unknown. Based on a visual approximation of custom maps produced by the California Energy Commission, this analysis identified 22 natural gas and 9 petroleum pipelines located in the study area. This analysis conservatively assumes that each pipeline will be subject to repair or maintenance over the next 22 years.	+
Incremental impacts may be incurred in areas where new power plants are constructed within the study area. However projecting these impacts given the uncertainty of future energy activities in California is beyond the scope of this analysis.	-
+: This assumption may result in an overestimate of real costs. - : This assumption may result in an underestimate of real costs. +/-: This assumption has an unknown effect on estimates.	

CHAPTER 11 | FIRE MANAGEMENT ACTIVITIES

188. This section describes potential impacts on forest fuels reduction and wildland fire suppression activities (collectively referred to as "fire management" activities) due to conservation measures for the frog. The proposed rule identifies the dewatering of aquatic habitat used by the frog due to water drafting as the most significant threat to the frog and its habitat associated with fire management activities.[151]

189. The proposed rule identifies fire management activities as a threat to the frog in five proposed critical habitat units: BUT-1, YUB-1, NEV-1, PLA-1, and ELD-1.[152] In general, the primary agencies engaging in fire management activities in California are the USFS, the BLM, and CAL FIRE. To a lesser extent, private timberland owners also engage in fire management activities with funding from CAL FIRE.[153] Although, the USFS, BLM, and CAL FIRE all implement conservation measures for the frog as part of fire management activities, these measures are part of broader aquatic and riparian habitat management guidelines. That is, the same conservation measures would be implemented in the absence of the frog and its habitat. Thus, the impacts on fire management activities associated with frog conservation are limited to the administrative cost of section 7 consultation summarized in Exhibit 11-1. Costs associated with frog survey and monitoring estimated in Chapter 12.

190. The remainder of this chapter describes the extent of fire management activities in the study area and discusses existing aquatic and riparian guidelines followed during fire management activities by the primary agencies responsible for fire management activities in the study area.

[151] 73 FR 53492

[152] 73 FR 53492

[153] California Department of Forestry and Fire Protection. 2006. Procedural Guide for Community Assistance Grant Fuel Reduction Projects Funded by Proposition 40, Sierra Nevada Forest Land and Fuels Management. State of California – The Resources Agency, California Department of Forestry and Fire Protection.

EXHIBIT 11-1 SUMMARY OF IMPACTS TO FIRE MANAGEMENT ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	UNDISCOUNTED COSTS	PRESENT VALUE COSTS
Pre-Designation Impacts (1996 - 2008)		
BUT-1	$14,100	$21,800
LOS-1	$10,600	$14,800
NEV-1	$841	$1,300
VEN-2	$1,510	$2,110
Total	**$27,00**	**$40,000**
Post-Designation Baseline Impacts (2009 - 2030)		
BUT-1	$23,800	$12,000
LOS-1	$17,900	$9,000
NEV-1	$1,420	$715
VEN-2	$2,550	$1,280
Total	**$45,600**	**$23,000**
Post-Designation Incremental Impacts (2009 - 2030)		
LOS-1	$5,970	$3,000
NEV-1	$48,900	$24,600
PLA-1	$21,900	$11,000
VEN-2	$851	$428
Total	**$77,700**	**$39,000**
Note: Totals may not sum due to rounding.		

11.1 FIRE MANAGEMENT ACTIVITIES IN THE STUDY AREA

191. Fire management activities within the study area include two types of activities: fuel treatment activities and fire suppression activities. Exhibit 11-1 provides estimates of the areas within affected critical habitat units where the potential for fire management activities are expected to be highest. The following sections describe each type of fire management activity in more detail.

- **Fuel Treatment Activities** include mechanical thinning, mastication, construction of fuel breaks, and controlled understory burns. Fuel treatment activities are expected to occur most frequently within areas where the risk of wildfires is great due to the build-up of forest fuels. Exhibit 11-2 presents areas within each of the five units where the forest fuel loading potential is high or very high.
- **Fire Suppression Activities** focus on minimizing the spread of existing wildland fires and include measures, such as, fireline construction and the aerial application

of water.[154] Fire suppression activities are expected to occur most frequently in areas where the risk of wildfire and potential damages caused by wildfire are high. Wildland-Urban Interface (WUI) areas define areas where man-made structures meet or intermingle with wildland vegetation.[155] The potential for damage to humans (i.e., loss of lives or property) caused by wildland fires is greatest within WUI areas. Exhibit 11-3 presents WUI areas within the five units where the risk of wildfire is high, very high, or extremely high.

EXHIBIT 11-1 AREAS WHERE FUEL REDUCTION AND FIRE SUPPRESSION ACTIVITIES ARE LIKELY TO OCCUR BY AFFECTED UNIT

UNIT	TOTAL ACRES	EXTENT OF AREAS WHERE FUEL REDUCTION ACTIVITIES ARE LIKELY TO OCCUR (ACRES)	EXTENT OF AREAS WHERE FIRE SUPPRESSION ACTIVITIES ARE LIKELY TO OCCUR (ACRES)
BUT-1	5,290	4,960	0
ELD-1	5,530	4,710	5,130
NEV-1	8,290	7,780	7,720
PLA-1	1,240	968	949
YUB-1	6,320	6,080	5,040

Sources:
(1) California Department of Forestry and Fire Protection. 2005. Fuel Rank. Accessed January 12, 2009. http://frap.cdf.ca.gov/data/frapgismaps/select.asp?theme=5 .
(2) California Department of Forestry and Fire Protection. 2003. Wildland Urban Interface (WUI) Fire Threat. Accessed on January 12, 2009. http://frap.cdf.ca.gov/data/frapgismaps/select.asp?theme=5

[154] Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009; and, Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009.

[155] University of Wisconsin - SILVIS Lab. The Wildland Urban Interface. Accessed January 10, 2009. http://silvis.forest.wisc.edu/projects/WUI_Main.asp

EXHIBIT 11-2 AREAS OF HIGH OR VERY HIGH FUEL LOADING POTENTIAL WITHIN THE FIVE CHD UNITS THREATENED BY FIRE MANAGEMENT ACTIVITIES

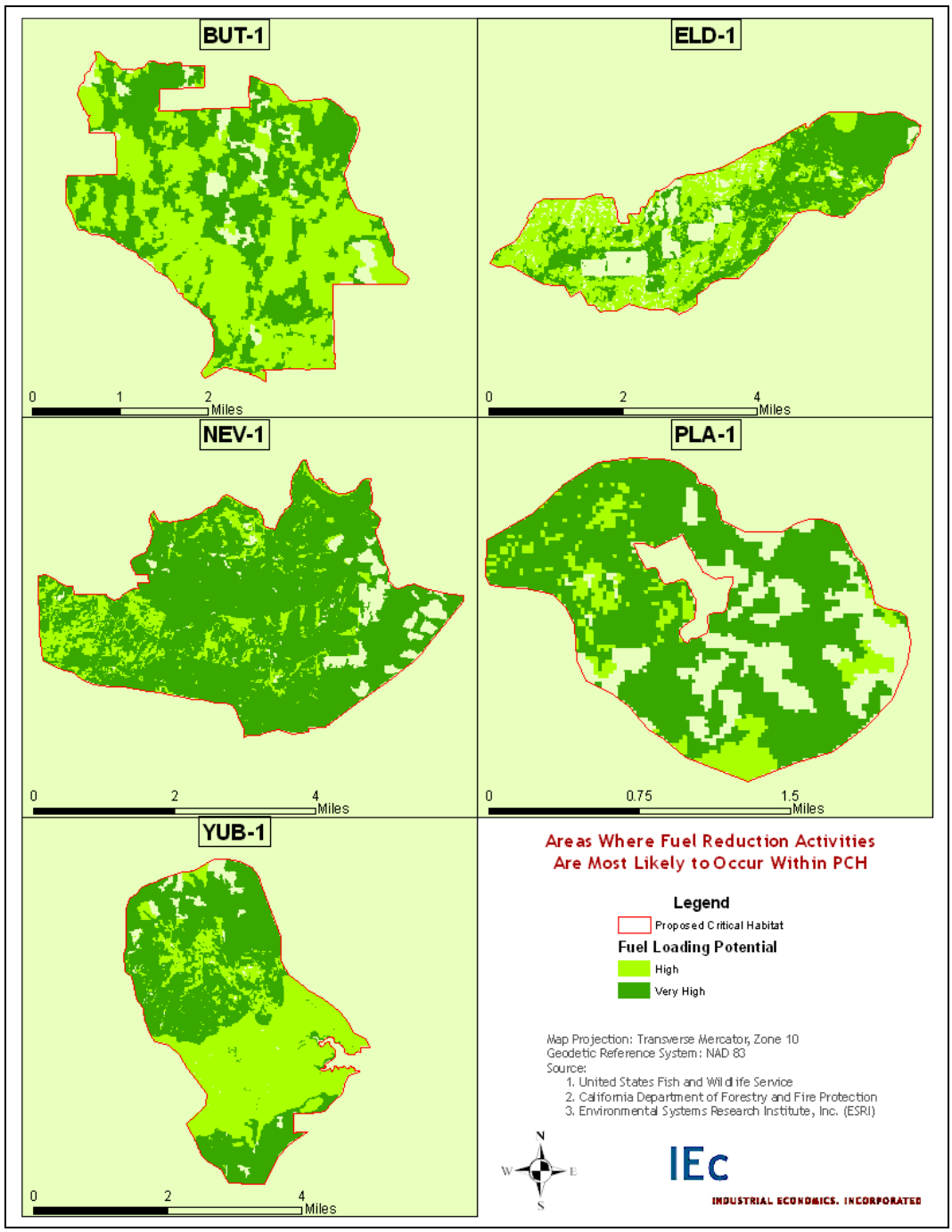
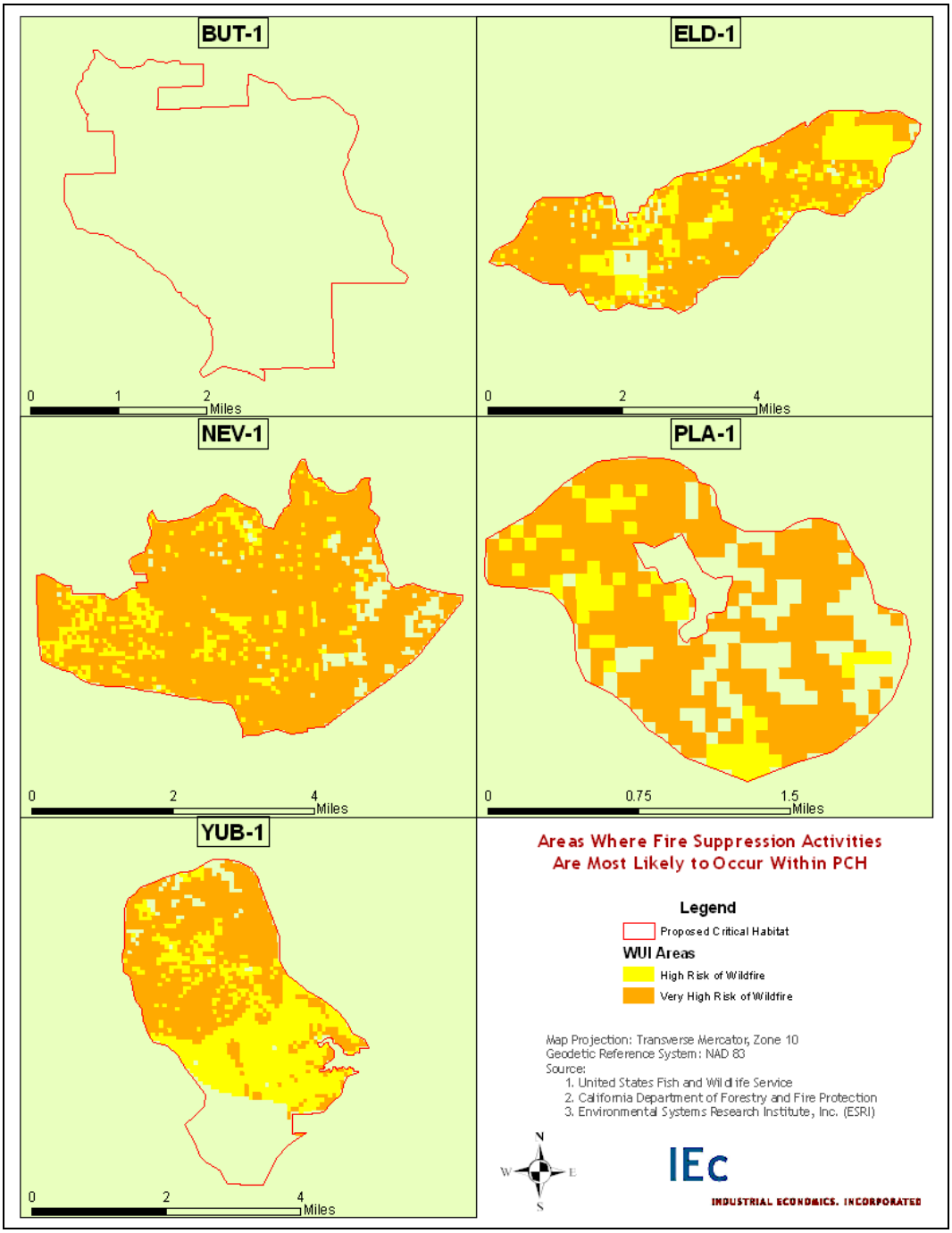


EXHIBIT 11-3 WUI AREAS WHERE THE RISK OF FIRE IS HIGH OR VERY HIGH WITHIN THE FIVE CHD UNITS THREATENED BY FIRE MANAGEMENT ACTIVITIES



11.2 FROG CONSERVATION AND EXISTING FIRE MANAGEMENT GUIDELINES AND STANDARDS

192. The final listing rule for the frog describes the threat of wildland fires on the frog and its habitat as follows:

> "Periodic wildfires may adversely affect California red-legged frogs by causing direct mortality, destroying streamside vegetation, or eliminating vegetation that protect the watershed."[156]

Given the severity of threats to the frog associated with wildland fires, fire management activities, which limit the potential and severity of wildfires, may contribute to frog conservation efforts. However, fire management activities may also result in adverse impact to the frog and its habitat.

193. Since the listing of the species in 1996, there has been only one consultation on fire management activities for the frog in 2003 in the Angeles National Forest. Frog conservation measures implemented for fire management activities are designed to preserve water quality and protect riparian and aquatic areas. Examples of conservation measures required to protect the frog and/or its habitat include:

- Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles;
- Avoid establishing staging bases, heli-bases, base camps, firelines or other areas of human concentration and equipment use within frog suitable and occupied habitat and riparian areas to the maximum extent possible;
- Maintain and enhance soil productivity in riparian and upland areas by retention of standing and down coarse woody debris; and
- Avoid or minimize soil erosion by retention of ground cover in riparian and upland areas.

A review of existing guidelines to protect riparian and aquatic areas adjacent to fire management activities indicate that these types of conservation measures are expected to occur even in the absence of the frog and its habitat as a result of existing best management practices. For example, the California State Board of Forestry and Fire Protection note that any project that alters vegetation has the potential to: "impact soil erosion, land stability, fisheries, water quality, water storage and conveyance facilities, and domestic water supplies."[157] According, the primary agencies responsible for fire management activities (USFS, BLM, CAL FIRE) follow specific guidelines to minimize the impact of fire management activities on natural resources. The following sections describe existing guidelines and standards on Federal and non-Federal lands, respectively.

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[156] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-Legged Frog (*Rana aurora draytonii*); Final Rule, published in the *Federal Register* on May 23, 1996, Vol. 61, No. 101; U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants.

[157] California State Board of Forestry and Fire Protection. 2006. Vegetation Treatment Program Environmental Impact Report Notice of Preparation. Sacramento, California.

Fire Management on Federal Lands

194. All USFS land (portions of Plumas, Eldorado, and Tahoe National Forests) within affected critical habitat units is covered by the SNFPA. As previously discussed in Chapter 8, the SNFPA contains detailed standards and guidelines protecting aquatic and riparian habitats. These standards and guidelines apply to all projects implemented within the National Forests covered by the SNFPA, including fire management activities. In addition to the standards and guidelines described in Chapter 8, the SNFPA includes specific standards and guidelines for fire management activities:[158]

- Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in RCAs. In burn plans for project areas that include, or are adjacent to RCAs, identify mitigation measures to minimize the spread of fire into riparian vegetation.
- Within CARS, in occupied or essential habitat for threatened, endangered, or sensitive species, evaluate the appropriate role, timing, and extent of prescribed fire. Avoid direct lighting within riparian vegetation.
- Use screening devices for water drafting pumps (fire suppression activities are exempt during initial attack). Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats.
- Allow mechanical ground disturbing fuels treatments, hazard tree removal, salvage harvest, or commercial fuelwood cutting within RCAs or CARs, only when the activity is consistent with riparian conservation objectives.

Similar to the USFS, during fire management activities the BLM follows watershed management protection measures and requires the development of watershed-specific measures.[159] Further, the BLM follows all relevant best management practices when engaging in projects in or adjacent to aquatic or riparian habitats.[160] Based on discussions with BLM staff, fire management activities that may affect the frog and its habitat are most likely to occur on BLM lands managed by the Folsom Field Office of the BLM (including areas in ELD-1, NEV-1, PLA-1 and YUB-1).[161] The Regional Management Plan for the Folsom Field Office includes only one protection measure for the frog related

[158] U.S. Forest Service. 2004. Record of Decision: Sierra Nevada Forest Plan Amendment – Final Supplemental Environmental Impact Statement. United States Department of Agriculture, Forest Service, Pacific Southwest Region.

[159] United States Department of the Interior, Bureau of Land Management. 2008. Sierra Resource Management Plan and Record of Decision for the Folsom Field Office California.

[160] Personal Communication with Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009.

[161] Based on review of Folsom Field Office Boundary Map. Accessed January 12, 2008. http://www.blm.gov/ca/st/en/fo/folsom/mapfolsom2.html

to fire management: apply existing BLM guidelines of no fire retardant within 300 feet of wetlands and, if possible, avoid retardant drops within 500 feet of wetlands.[162]

Fire Management on State and Private Lands

195. Fire management activities on State and private lands are implemented as part of four main programs administered by CAL FIRE:

(1) Vegetation Management Program;

(2) Prefire Management Program;

(3) California Forest Improvement Program; and

(4) Proposition 40 Fuels Reduction Program.[163]

Proposed projects under each of these programs are subject to review by CAL FIRE. Although specific guidelines for the protection of aquatic and riparian habitat do not exist for these programs, proposed projects are expected to address aquatic and riparian habitat conservation, if relevant to the project.[164] Any conservation measures implemented to limit impacts on aquatic and riparian habitats are considered to be beneficial to the frog and its habitat. The specific measures implemented vary depending on the project, but are expected to be at least equivalent to the timber harvest guidelines for State and private lands described in Chapter 8.

11.3 POST-DESIGNATION IMPACTS

196. The post-designation period for this analysis is 2009 to 2030. Based on the occurrence of one formal consultation for fire management activities in the Angeles National Forest between 1996 and 2008, approximately two consultations are expected to occur between 2009 and 2030 in Angeles National Forest.[165] Average consultation costs (as shown in Exhibit 2-2 in Chapter 2) are applied to the number of predicted formal consultations. The number of consultations are spread evenly across years and over time.

197. The Tahoe National Forest expects to undergo an additional formal consultation on fire management activities every five years due to the designation of critical habitat for the frog.[166] Since this consultation would not occur absent critical habitat, all the

[162] United States Department of the Interior, Bureau of Land Management. 2008. Sierra Resource Management Plan and Record of Decision for the Folsom Field Office California.

[163] California State Board of Forestry and Fire Protection. 2006. Vegetation Treatment Program Environmental Impact Report Notice of Preparation. Sacramento, California.

[164] Based on review of: (1) California Department of Forestry and Fire Protection. 2006. Procedural Guide for Community Assistance Grant Fuel Reduction Projects Funded by Proposition 40, Sierra Nevada Forest Land and Fuels Management. State of California – The Resources Agency, California Department of Forestry and Fire Protection; (2) California Department of Forestry and Fire Protection. 2004. Vegetation Management Program Fact Sheet. Accessed online at: http://www.fire.ca.gov/resource_mgt/resource_mgt_vegetation.php on January 12, 2009; and (3) California Department of Forestry and Fire Protection. 2007. California Forest Improvement Program: User's Guide 2007 Edition, Volume 1.

[165] Based on review of formal consultation history from 1996 through 2008.

[166] Personal communication with Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

administrative costs of the consultation are included as incremental impacts. Average consultation costs (as shown in Exhibit 2-2 in Chapter 2) are applied to the number of predicted formal consultations. The number of consultations are spread evenly across years and over time.

11.4 SOURCES OF UNCERTAINTY

198. Under the 50 CFR 402.04 Counter Regulations National Forests are able to forgo section 7 consultation with the Service on forest fuels management projects if a biological assessment leads to a no adverse effects finding. The administrative costs associated with developing biological assessments for such projects are relevant to this analysis. Currently, the annual number of biological assessments the USFS conducts for the frog within the study area that do not require section 7 consultation is unknown. Therefore, the administrative costs of such biological assessments are not quantified in this analysis. To the extent that additional biological assessments, unrelated to section 7 consultations, occur on USFS land within the study area, this analysis underestimates baseline administrative impacts.

199. Other sources of uncertainty in the estimates provided in this Chapter primarily concern the extent of fire management activities reviewed. This analysis is limited to the consideration of impacts on fire management activities within the five critical habitat units where fire management activities are identified as a threat to the frog (BUT-1, ELD-1, NEV-1, PLA-1, and YUB-1). To the extent that special management considerations for fire management activities are required in additional critical habitat units, total impact estimates may increase.

CHAPTER 12 | HABITAT AND VEGETATION MANAGEMENT ACTIVITIES

200. This chapter describes past and ongoing research, survey and monitoring, and habitat and vegetation management activities implemented for the frog. Unlike the other activities described in this analysis, the activities described in this section do not pose a threat to the frog or its habitat. Rather, the activities described in this chapter are implemented specifically to benefit the frog and its habitat.

201. In general, baseline impacts are related to ongoing survey and monitoring efforts for the frog on Federal and State land. Based on discussions with affected Federal and State agencies, surveying and monitoring efforts, as well as habitat management activities are not expected to change due to the designation of critical habitat. Accordingly, the only incremental impacts quantified in this analysis are related to the administrative costs of section 7 consultations addressing adverse modification of critical habitat. Impacts on habitat and vegetation management activities are summarized in Exhibit 12-1 and further described in the following sections.

EXHIBIT 12-1 SUMMARY OF COSTS OF ACTIVE FROG MANAGEMENT ACTIVITIES (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

VALUES	COSTS
Pre-Designation Impacts (1996 – 2008)	
Present Value of Impacts	$721,000
Post-Designation Baseline Impacts (2009 – 2030)	
Present Value of Impacts	$454,000
Annualized Impact Value	$41,100
Incremental Impacts (2009 – 2030)	
Present Value of Impacts	$68,500
Annualized Impact Value	$6,190

12.1 PRE-DESIGNATION IMPACTS

202. The USFS and BLM conduct periodic surveys for the frog to identify frog populations on the land they manage within the study area.[167] Additionally, the USFS and BLM conduct site assessments for the frog prior to the implementation of proposed projects in areas containing suitable frog habitat. Further, the BLM conducts habitat and population monitoring for the frog in the Spivey Pond management area.[168] Survey and monitoring activities for the frog have occurred since the species was listed in 1996 and are expected to continue for the foreseeable future on Federal lands in the study area.

203. The BLM actively manages the Spivey Pond management area for the frog. Frog habitat in this area consists primarily of abandoned ponds originally used for grazing. Specific management activities include removing non-native vegetation and non-native predators from the ponds inhabited by the frog. Additionally, no management activities, such as, grazing and ranching and timber harvest activities, take place in the Spivey Pond Management area in order to preserve frog habitat. The BLM has also considered constructing suitable ponds for the frog, similar to those located within the Spivey Pond management area, on BLM land near San Bernardino, California where an additional frog population has been identified. To date, the BLM has not installed any ponds for the frog nor do they have any definite plans to install ponds in the future. Therefore, impacts associated with constructing additional ponds for the frog on BLM land within the study area are not quantified in this analysis.[169]

204. Currently, there is not enough information to quantify impacts on the BLM associated with the Spivey Pond management area. Additional data and/or information are invited on the Spivey Pond management area and the potential economic impacts due to frog conservation on BLM lands. It is anticipated that any new information received during the public comment period will be included in the final version of this report.

205. To date, the USFS has not engaged in active habitat or vegetation management for the frog.[170] However, the USFS has discussed constructing ponds for the frog in areas of the Tahoe National Forest located adjacent to a known frog population on private lands.[171] However, the USFS has no specific plans to construct ponds for the frog at this time. Further, Eldorado National Forest has considered purchasing additional private lands for

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[167] Personal communication with Valerie Hubbartt, Wildlife Biologist, Los Padres National Forest, on December 1, 2008; Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009; Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[168] Personal communication with Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009.

[169] Personal communication with Amy Fesnock, Threatened and Endangered Species Specialist, California Bureau of Land Management, on January 5, 2009.

[170] Personal communication with Valerie Hubbartt, Wildlife Biologist, Los Padres National Forest, on December 1, 2008; Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[171] Personal Communication with Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

the frog.[172] The location of such purchases would be determined by the designation of critical habitat. Given that Eldorado National Forest has no specific plan to purchase additional lands for the frog in the near future, the costs of such purchases are not quantified in this analysis. However, if Eldorado National Forest were to purchase land for the frog in the future, the costs of such purchases would represent incremental impacts of the designation of critical habitat.

206. The pre-designation impacts quantified in this analysis are due to past surveying and monitoring efforts for the frog on the Tahoe, Eldorado, and Plumas National Forests (approximately $480,000 since 1996, undiscounted).[173,174] Additionally, administrative costs of section 7 consultation on habitat and vegetation management projects throughout the study area are included as part of the pre-designation impacts (approximately $241,000 since 1996, undiscounted). Exhibit 12-2 presents pre-designation impacts related to surveying, monitoring, and habitat and vegetation management for the frog by unit.

EXHIBIT 12-2 PRE-DESIGNATION IMPACTS RELATED TO SURVEYING, MONITORING, AND HABITAT & VEGETATION MANAGEMENT FOR THE FROG BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS
ALA-1A	$25
ALA-1B	$69
ALA-2	$1,920
BUT-1	$155,000
CCS-1	$122
CCS-2	$1,160
ELD-1	$275,000
LOS-1	$8,090
MNT-1	$69
MNT-2	$16,200
MNT-3	$3,820
MRN-1	$3,050
MRN-2	$8,820
MRN-3	$13,300
NEV-1	$190,000

[172] Personal Communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009.

[173] Personal Communication with Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

[174] Surveying and monitoring cost estimates for the Plumas and Eldorado National Forests are based on cost estimates received from the Tahoe National Forest. That is, this analysis assumes, for lack of better information, that the surveying and monitoring efforts on the Plumas and Eldorado National Forests are the same as the efforts on the Tahoe National Forest.

UNIT	PRESENT VALUE IMPACTS
PLA-1	$84,900
SCZ-1	$88,000
SCZ-2	$5,140
SLO-1	$27,100
SLO-2	$13,200
SLO-3	$14,200
SLO-4	$4,290
SNB-1	$1,420
SNB-2	$679
SNB-3	$2,510
SNM-1	$283
SNM-2	$1,850
SON-3	$302
STB-1	$5,400
STB-2	$7,190
STB-3	$10,200
STB-4	$1,740
STB-5	$2,600
STB-6	$2,430
STB-7	$37,000
STC-1	$258
STC-2	$3,030
VEN-1	$1,910
VEN-2	$10,400
VEN-3	$3,280
YUB-1	$120,000
Total	**$1,120,000**

12.2 POST-DESIGNATION IMPACTS

207. Post-designation impacts stem from continued surveying and monitoring efforts for the frog in the Tahoe, Eldorado, and Plumas National Forests (approximately $22,500 annually, undiscounted). Surveying and monitoring efforts for the frog in these National Forests are not expected to increase as a result of critical habitat designation.[175] Thus, all impacts related to surveying and monitoring for the frog on USFS land are included as part of the economic baseline. Additional post-designation baseline impacts stem from the administrative costs of section 7 consultation (approximately $18,600 annually,

[175] Personal communication with Dawn Lipton, Wildlife Biologist, Eldorado National Forest, on January 6, 2009; and, Tina Mark, Wildlife Biologist, Tahoe National Forest, on January 7, 2009.

undiscounted). All post-designation incremental impacts stem from the administrative cost of addressing adverse modification during baseline consultations for the frog (approximately $6,190 annually, undiscounted). No new consultations are expected to occur as a result of critical habitat designation. Exhibits 12-3 and 12-4 present post-designation baseline and incremental impacts by unit.

EXHIBIT 12-3 POST-DESIGNATION BASELINE IMPACTS RELATED TO SURVEYING, MONITORING, AND HABITAT & VEGETATION MANAGEMENT FOR THE FROG BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
ALA-1A	$20	$2
ALA-1B	$55	$5
ALA-2	$1,530	$138
BUT-1	$46,800	$4,230
CCS-1	$97	$9
CCS-2	$924	$84
ELD-1	$83,000	$7,500
LOS-1	$5,950	$538
MNT-1	$50	$4
MNT-2	$11,700	$1,060
MNT-3	$2,760	$249
MRN-1	$1,230	$111
MRN-2	$3,560	$322
MRN-3	$5,360	$485
NEV-1	$57,300	$5,180
PLA-1	$25,700	$2,320
SCZ-1	$65,300	$5,900
SCZ-2	$3,810	$345
SLO-1	$11,500	$1,040
SLO-2	$9,220	$834
SLO-3	$9,970	$901
SLO-4	$3,000	$271
SNB-1	$970	$88
SNB-2	$464	$42
SNB-3	$1,710	$155
SNM-1	$225	$20
SNM-2	$1,410	$128
SON-3	$122	$11
STB-1	$4,160	$376

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
STB-2	$5,580	$504
STB-3	$7,870	$711
STB-4	$1,350	$122
STB-5	$2,020	$182
STB-6	$1,880	$170
STB-7	$27,800	$2,510
STC-1	$205	$19
STC-2	$2,400	$217
VEN-1	$1,330	$120
VEN-2	$7,490	$677
VEN-3	$2,280	$206
YUB-1	$36,100	$3,270
Total	**$454,000**	**$41,100**

EXHIBIT 12-4 POST-DESIGNATION INCREMENTAL IMPACTS RELATED TO SURVEYING, MONITORING, AND HABITAT & VEGETATION MANAGEMENT FOR THE FROG BY UNIT (2008 DOLLARS, ASSUMING A SEVEN PERCENT DISCOUNT RATE)

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
ALA-1A	$7	$1
ALA-1B	$18	$2
ALA-2	$510	$46
CCS-1	$32	$3
CCS-2	$308	$28
LOS-1	$1,990	$179
MNT-1	$17	$1
MNT-2	$3,910	$354
MNT-3	$919	$83
MRN-1	$411	$37
MRN-2	$1,190	$107
MRN-3	$1,790	$162
SCZ-1	$21,800	$1,970
SCZ-2	$1,270	$115
SLO-1	$3,820	$345
SLO-2	$3,080	$278
SLO-3	$3,320	$300
SLO-4	$1,000	$91

UNIT	PRESENT VALUE IMPACTS	ANNUALIZED IMPACTS
SNB-1	$323	$29
SNB-2	$155	$14
SNB-3	$571	$52
SNM-1	$75	$7
SNM-2	$471	$43
SON-3	$41	$4
STB-1	$1,390	$125
STB-2	$1,860	$168
STB-3	$2,620	$237
STB-4	$449	$41
STB-5	$672	$61
STB-6	$627	$57
STB-7	$9,270	$838
STC-1	$68	$6
STC-2	$799	$72
VEN-1	$443	$40
VEN-2	$2,500	$226
VEN-3	$761	$69
Total	**$68,500**	**$6,190**

12.3 SOURCES OF UNCERTAINTY

208. The sources of uncertainty in the estimates provided in this Chapter primarily concern currently available data. In several cases, data have been requested from stakeholders but has not been forthcoming. Total impact estimates may increase as information becomes available.[176] For example, should BLM or USFS construct additional ponds or purchase lands for the frog, the costs of habitat management may be understated.

[176] Analysis assumes that surveying and monitoring efforts for the frog in the Plumas and Eldorado National Forests are equal to efforts in the Tahoe National Forest.

CHAPTER 13 | ECONOMIC BENEFITS

209. Characterization of the potential economic benefits of critical habitat designation for the frog provides context to the cost analyses presented in the preceding chapters. This chapter first describes the categories of economic benefit that may derive from the conservation of species and habitats, and discusses the research methods that economists employ to quantify these benefits. Next, this chapter summarizes the frog conservation efforts described in Chapters 4 through 12 of this report and links them with potential categories of economic benefit that may derive from their implementation. This chapter does not, however, attempt to quantify the potential baseline and incremental benefits described.

13.1 CATEGORIES OF BENEFIT RELATING TO SPECIES AND HABITAT CONSERVATION

210. The primary goal of listing a species is to preserve the species from extinction. Various economic benefits, measured in terms of social welfare or regional economic performance, may also result from species and habitat conservation. The benefits of species and habitat conservation can be placed into two broad categories: (1) those associated with the primary goal of species conservation, and (2) those that derive from the habitat conservation efforts to achieve this primary goal.

211. Because a purpose of the Act is to provide for the conservation of endangered and threatened species, the benefits of actions taken under the Act are often measured in terms of the value placed by the public on species preservation (e.g., avoidance of extinction, and/or increase in a species' population). Such social welfare values for a species may reflect both use and non-use values for the species. Use values derive from a direct use for a species, such as commercial harvesting or recreational wildlife-viewing opportunities. Non-use values are not derived from direct use of the species, but instead reflect the utility the public derives from knowledge that a species continues to exist (e.g., existence or bequest values).

212. As a result of actions taken to preserve endangered and threatened species, such as habitat management, various other benefits may accrue to the public. Conservation efforts for species and habitat may result in improved environmental quality, which in turn may have collateral human health or recreational use benefits. In addition, conservation efforts undertaken for the benefit of a threatened or endangered species may enhance shared habitat for other wildlife. Such benefits may be a direct result of modifications to projects, or may be collateral to such actions. For example, a section 7 consultation may result in the conservation of buffer strips along streams, in order to reduce sedimentation due to construction activities. A reduction in sediment load may

directly benefit water quality, while the presence of buffer strips may also provide the collateral benefits of preserving habitat for terrestrial species and enhancing nearby residential property values (e.g., preservation of open space).

213. Economists apply a variety of methodological approaches in estimating both use and non-use values for species and for habitat improvements, including stated preference and revealed preference methods. Stated preference techniques include the contingent valuation method and conjoint analysis or contingent ranking methods. In simplest terms, these methods employ survey techniques, asking respondents to state what they would be willing to pay for a resource or for programs designed to protect that resource. A substantial literature has developed that describes the application of this technique to the valuation of natural resource assets.

214. More specific to use values for species or habitats, revealed preference techniques examine individuals' behavior in markets in response to changes in environmental or other amenities, i.e., people "reveal" their value by their behavior. For example, travel cost models are frequently applied to value access to recreational opportunities, as well as to value changes in the quality and characteristics of these opportunities. Basic travel cost models are rooted in the idea that the value of a recreation resource can be estimated by analyzing the travel and time costs incurred by individuals visiting the site. Another revealed preference technique is hedonic analysis, which is often employed to determine the effect of specific site characteristics on property values.

13.2 POTENTIAL BENEFITS OF CALIFORNIA RED-LEGGED FROG CONSERVATION

215. This section describes the categories of benefits resulting from frog conservation efforts within the study area. Exhibit 13-1 summarizes potential benefits associated with the specific frog conservation efforts described in Chapters 4 through 12 of this report. The first column summarizes frog conservation efforts by land use activity. The second column identifies potential categories of benefits that may derive from implementation of these conservation efforts. A description of these categories of benefit is provided below. The final columns of the exhibit identify the units in which baseline or incremental benefits may occur. Whether the benefits deriving from the conservation efforts are baseline or incremental depends on the reason for implementing the effort. The baseline or incremental status of the conservation effort summarized in the exhibit is as described for each activity and unit in Chapters 4 through 12 of this report.

216. The categories of economic benefit that may derive from the frog conservation efforts described in this report include:

- **Property value benefits:** Open space or decreased density of development resulting from frog conservation may increase nearby property values.
- **Improved water quality:** Limiting or redistributing development, as well as managing economic activities that occur adjacent to riparian and aquatic habitats (e.g., agriculture, construction, and timber harvests) may improve water quality. Water quality improvements may in turn have human health and human use (e.g., recreation) benefits.

- **Aesthetic benefits:** Social welfare gains may be associated with enhanced aesthetic quality of habitat. Preferences for aesthetic improvements may be measured through increased willingness-to-pay to visit a habitat region for recreation or increased visitation.
- **Flood control:** Maintaining or enhancing the flood control services provided by an ecosystem may increase property values within the watershed, and avoid costs of flood-related damage or replacement flood control programs.
- **Improved soil productivity:** Productive soils stabilize wetland habitat and relate to water quality and recreational use values.
- **Regional economic benefits:** To the extent that increased open space, aesthetic benefits, or improved water quality lead to an increase in visitation to the region (e.g., for recreation such as hiking or wildlife-viewing), the economy and employment may benefit from increased regional spending.

217. In addition to these categories of potential benefit, all of the conservation efforts described in Exhibit 13-1 are related to the broader conservation and recovery of the species. For example, monitoring and surveying for the species is undertaken to better understand the effects of projects on species, and therefore inform the avoidance or minimization of those effects. All conservation efforts therefore relate to the maintenance or enhancement of the use (e.g., wildlife-viewing) and non-use value (e.g., existence value) that the public may hold specifically for the frog. Further, many of the conservation efforts undertaken for the frog may also result in improvements to ecosystem health that are shared by other, coexisting species. The maintenance or enhancement of use and non-use values for these other species, or for biodiversity in general, may also result from these frog conservation efforts.

EXHIBIT 13-1 FROG CONSERVATION EFFORTS AND POTENTIAL ASSOCIATED BENEFITS

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
RESIDENTIAL AND COMMERCIAL DEVELOPMENT			
Project site restoration or revegetation.	• Property value benefits • Improved water quality • Regional economic benefits	All	All
Purchase conservation habitat to offset development.			
Season work restrictions.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Hiring a Service-approved biologist to survey the site, oversee project activities, relocate frogs from the project site, and train workers.	*Not Applicable*		

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
Exotic species removal.	• Improved water quality • Aesthetic benefits • Regional economic benefits		
WATER MANAGEMENT			
Hiring a Service-approved biologist to survey the site, oversee project activities, relocate frogs from the project site, and train workers.	*Not Applicable*	All	Incremental impacts limited to administrative costs.
Conducting work outside of the breeding season between April and October.	*Not Applicable*		
Clearing food trash from the work site daily.	• Improved water quality • Aesthetic benefits • Regional economic benefits		
Conducting vehicle maintenance and fueling at least 66 feet from aquatic habitat.	• Improved water quality • Regional economic benefits		
Minimizing the spread of invasive species, pathogens, and disease in aquatic habitat.	• Improved water quality • Improved soil productivity • Regional economic benefits		
Screening dewatering pump intakes.	*Not Applicable*		
AGRICULTURE			
Avoid pesticide use in frog habitat and in buffer zones around frog habitat for 66 pesticide active ingredients.	• Improved water quality • Regional economic benefits	37 Units: ALA-2, CCS-1, CCS-2, ELD-1, MNT-2, MNT-3, MRN-1, MRN-2, MRN-3, NAP-1, NEV-1, RIV-1, SCZ-1, SCZ-2, SLO-1, SLO-2, SLO-3, SLO-4, SNB-1, SNB-2, SNB-3, SNM-1, SNM-2, SOL-1, SOL-2, SON-1, SON-2, SON-3, STB-2, STB-3, STB-5, STB-6, STB-7, STC-1, STC-2, VEN-1, VEN-3	36 UNITS: ALA-2, CCS-1, CCS-2, ELD-1, MNT-2, MNT-3, MRN-1, MRN-2, MRN-3, NAP-1, NEV-1, RIV-1, SCZ-1, SCZ-2, SLO-1, SLO-2, SLO-3, SLO-4, SNB-1, SNB-2, SNB-3, SNM-1, SNM-2, SOL-1, SOL-2, SOL-3, SON-1, SON-2, SON-3, STB-2, STB-3, STB-5, STB-6, STB-7, STC-1, STC-2, VEN-1, VEN-3

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
RANCHING/GRAZING			
Implement best management practices (BMPs) for protection of aquatic and riparian habitat.	• Improved water quality • Flood control • Regional economic benefits	SOL-1, SOL-3	Incremental impacts limited to administrative costs.
TIMBER HARVEST			
Implement best management practices (BMPs) for protection of aquatic and riparian habitat.	• Improved water quality • Flood control • Regional economic benefits	5 Units: BUT-1, ELD-1, NEV-1, PLA-1, YUB-1	Incremental impacts limited to administrative costs.
TRANSPORTATION			
Pre-construction survey, capture and removal of any frogs by qualified biologists.	*Not Applicable*	All	Incremental impacts limited to administrative costs.
Construction confined to the dry season.	• Improved water quality • Regional economic benefits		
In areas temporarily disturbed, vegetation will be removed by hand, where feasible, instead of by heavy equipment.	*Not Applicable*		
No water will be used from streams or ponds that support the frog.	• Improved water quality • Flood control • Regional economic benefits		
Ground disturbance and vegetation clearing along river banks will be minimized.	• Improved water quality • Flood control • Regional economic benefits • Improved soil productivity		
Construction of temporary silt dams to minimize sedimentation.	• Improved water quality • Flood control • Regional economic benefits		
Upon project completion, hydroseed project areas to stabilize soils prior to the onset of winter rains.	• Improved water quality • Flood control • Improved soil productivity • Regional economic benefits		

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
FIRE SUPPRESSION			
Design and manage fuel treatments to minimize the risk that treated areas will be used by unauthorized motorized and mechanized vehicles.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits	5 Units: BUT-1, ELD-1, NEV-1, PLA-1, YUB-1	Incremental impacts limited to administrative costs.
Avoid establishing staging bases, heli-bases, base camps, firelines or other areas of human concentration and equipment use within frog suitable and occupied habitat and riparian areas to the maximum extent possible.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Maintain and enhance soil productivity in riparian and upland areas by retention of standing and down coarse woody debris.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Avoid or minimize soil erosion by retention of ground cover in riparian and upland areas.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
HABITAT MANAGEMENT			
Pre-construction frog surveys and removal of identified frogs.	*Not Applicable*	ALL	Incremental impacts limited to administrative costs.
Biologist on-site during all activities.	*Not Applicable*		
Worker education and training session.	*Not Applicable*		
Revegetate and re-contour all disturbed areas with native vegetation.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Construction work limited to the dry season (May 1 – Oct 31) and/or low stream flow periods (June 1 – Nov 1).	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Construction equipment, staging areas, fueling and maintenance vehicles will be located outside of riparian and wetland areas.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Establishment of buffer zones around off-site parking areas.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		

CONSERVATION EFFORT	POTENTIAL ASSOCIATED BENEFITS	UNITS APPLIED	
		BASELINE BENEFIT	INCREMENTAL BENEFIT
UTILITY AND PIPELINE CONSTRUCTION			
Pre-construction frog surveys and removal of identified frogs.	*Not Applicable*	ALL	Incremental impacts limited to administrative costs.
Biologist on-site during all activities.	*Not Applicable*		
Worker education and training session.	*Not Applicable*		
Revegetate and re-contour all disturbed areas with native vegetation.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Construction work limited to the dry season (May 1 – Oct 31) and/or low stream flow periods (June 1 – Nov 1).	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Construction equipment, staging areas, fueling and maintenance vehicles will be located outside of riparian and wetland areas.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		
Establishment of buffer zones around off-site parking areas.	• Improved water quality • Flood control • Enhanced soil productivity • Regional economic benefits		

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Written communication with Chris Browder, California Department of Forestry and Fire Protection, December 30, 2008 and January 9, 2009.

APPENDIX A | INITIAL REGULATORY FLEXIBILITY ANALYSIS AND ENERGY IMPACT ANALYSIS

218. This appendix considers the extent to which the incremental impacts of critical habitat designation may be borne by small entities and the energy industry. The analysis presented in Section A.1 is conducted pursuant to the RFA as amended by the SBREFA of 1996. Information for this analysis was gathered from the U.S. Small Business Administration (SBA), the Service, and from interviews with stakeholders contacted during the development of the economic analysis. The energy analysis in Section A.2 is conducted pursuant to Executive Order No. 13211.

219. The analyses of impacts to small entities and the energy industry rely on the estimated *incremental* impacts resulting from the proposed critical habitat designation. The incremental impacts of the rulemaking are most relevant for the small business and energy impacts analyses, because they reflect costs that may be avoided or reduced based on decisions regarding the composition of the final rule. The post-designation baseline impacts associated with the listing of the frog and other State and local regulations and policies, as quantified in Chapters 4 through 12 of this report, are expected to occur regardless of the outcome of this rulemaking.

A.1 IMPACTS TO SMALL ENTITIES

220. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).[177]

221. If a proposed rule is not expected to have a significant impact on a substantial number of small entities, the RFA allows an agency to so certify the rule, in lieu of preparing an Initial Regulatory Flexibility Analysis (IRFA).[178] In the case of the proposed critical habitat for the frog, uncertainty exists regarding both the numbers of entities that will be impacted by the proposed rule and the degree of impact on individual entities. The problem is complicated by differences among entities – even within the same sector – as to the nature and size of their operations. Therefore, to ensure a broad consideration of impact on small entities, the Service has prepared this IRFA without first making the

[177] 5 U.S.C. § 601 et seq.

[178] Thus, for a regulatory flexibility analysis to be required, impacts must exceed a threshold for "significant impact" and a threshold for a "substantial number of small entities." 5 U.S.C. 605(b).

threshold determination of whether the proposed critical habitat designation could be certified as not having a significant economic impact on a substantial number of small entities.

222. This IRFA is intended to improve the Service's understanding of the effects of the proposed rule on small entities and to identify opportunities to minimize these impacts in the final rulemaking. Exhibit A-1 describes the components of an IRFA. The remainder of this section addresses each of these IRFA requirements.

EXHIBIT A-1 ELEMENTS OF AN IRFA

ELEMENTS OF AN INITIAL REGULATORY FLEXIBILITY ANALYSIS
1. A description of the reasons why the action by the agency is being considered.
2. A succinct statement of the objectives of, and legal basis for, the proposed.
3. A description- and, where feasible, an estimate of the number- of small entities to which the rule will apply.
4. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the types of professional skills necessary for the preparation of the report or record.
5. An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule.
6. A description of alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.
Source: Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 32.

A.1.1 REASONS FOR CONSIDERING THE PROPOSED ACTION

223. Section 4(a)(3) of the Endangered Species Act (Act) requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable.[179] Given that the frog is Federally-listed as threatened under the Act, the Service finds that the designation of critical habitat is required. Critical habitat was originally designated for the species on March 13, 2001, followed by a revised designation on April 13, 2006.[180] Then on December 12, 2007 the Center for Biological Diversity filed a complaint against the Service challenging the 2006 revision. In April 2008, the court entered a consent decree requiring a revised critical habitat rule by August 2009. On September 16, 2008, the Service published a Proposed Rule revising the designation of critical habitat for the frog.[181]

224. The benefits of critical habitat designation derive from section 7 of the Act, which requires that Federal agencies, in consultation with the Service, ensure that actions they carry out, permit or fund are not likely to destroy or adversely modify critical habitat. As

[179] 16 U.S.C. Sections 1531-1544.

[180] 66 FR 14626; 71 FR 19244

[181] 73 FR 53492.

noted above, the Act requires the Service to designate critical habitat for threatened and endangered species to the maximum extent prudent and determinable.

A.1.2 OBJECTIVES AND LEGAL BASIS OF THE PROPOSED RULE

225. The purpose of the proposed rule is to designate critical habitat for the frog pursuant to the Endangered Species Act (Act). Section 4(b)(2) of the Act requires that the Service designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts, of specifying any particular area as critical habitat." This section grants the Secretary [of Interior] discretion to exclude any area from critical habitat if (s)he determines "the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat". The Secretary's discretion is limited, as (s)he may not exclude areas if it "will result in the extinction of the species."

A.1.3 DESCRIPTION AND TYPES AND NUMBER OF SMALL ENTITIES TO WHICH THE RULE WILL APPLY

226. Three types of small entities are defined in the RFA:

- **Small Business -** Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The SBA has developed size standards to carry out the purposes of the Small Business Act, and those size standards can be found in 13 CFR 121.201. The size standards are matched to North American Industry Classification System (NAICS) industries. The SBA definition of a small business applies to a firm's parent company and all affiliates as a single entity.
- **Small Governmental Jurisdiction -** Section 601(5) defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000. Special districts may include those servicing irrigation, ports, parks and recreation, sanitation, drainage, soil and water conservation, road assessment, etc. When counties have populations greater than 50,000, those municipalities of fewer than 50,000 can be identified using population reports. Other types of small government entities are not as easily identified under this standard, as they are not typically classified by population.
- **Small Organization -** Section 601(4) defines a small organization as any not-for-profit enterprise that is independently owned and operated and not dominant in its field. Small organizations may include private hospitals, educational institutions, irrigation districts, public utilities, agricultural co-ops, etc.

227. The courts have held that the RFA/SBREFA requires Federal agencies to perform a regulatory flexibility analysis of forecast impacts to small entities that are directly regulated. In the case of *Mid-Tex Electric Cooperative, Inc., v. Federal Energy*

Regulatory Commission (FERC), FERC proposed regulations affecting the manner in which generating utilities incorporated construction work in progress in their rates. The generating utilities that expected to be regulated were large businesses; however, their customers – transmitting utilities such as electric cooperatives – included numerous small entities. In this case, the court agreed that FERC simply authorized large electric generators to pass these costs through to their transmitting and retail utility customers, and FERC could therefore certify that small entities were not directly impacted within the definition of the RFA.[182]

228. Similarly, *American Trucking Associations, Inc. v. Environmental Protection Agency* (EPA) addressed a rulemaking in which EPA established a primary national ambient air quality standard for ozone and particulate matter.[183] The basis of EPA's RFA/SBREFA certification was that this standard did not directly regulate small entities; instead, small entities were indirectly regulated through the implementation of state plans that incorporated the standards. The court found that, while EPA imposed regulation on states, it did not have authority under this rule to impose regulations directly on small entities and therefore small entities were not directly impacted within the definition of the RFA.

229. The SBA, in its guidance on how to comply with the RFA, recognizes that consideration of indirectly affected small entities is not required by the RFA, but encourages agencies to perform a regulatory flexibility analysis even when the impacts of its regulation are indirect.[184] "If an agency can accomplish its statutory mission in a more cost-effective manner, the Office of Advocacy [of the SBA] believes that it is good public policy to do so. The only way an agency can determine this is if it does not certify regulations that it knows will have a significant impact on small entities even if the small entities are regulated by a delegation of authority from the federal agency to some other governing body."[185]

230. The regulatory mechanism through which critical habitat protections are enforced is section 7 of the Act, which directly regulates only those activities carried out, funded, or permitted by a Federal agency. By definition, Federal agencies are not considered small entities, although the activities they may fund or permit may be proposed or carried out by small entities. Given the SBA guidance described above, this analysis considers the extent to which this designation could potentially affect small entities, regardless of whether these entities would be directly regulated by the Service through the proposed rule or by a delegation of impact from the directly regulated entity.

231. This IRFA focuses on small entities that may bear the estimated incremental impacts associated with the proposed rulemaking as described in Chapters 4 through 12 of this

[182] 773 F. 2d 327 (D.C. Cir. 1985).

[183] 175 F. 3d 1027, 1044 (D.C. Cir. 1999).

[184] Small Business Administration, Office of Advocacy. May 2003. A Guide for Government Agencies: How to Comply with the Regulatory Flexibility Act. pg. 20.

[185] *Ibid.*, pg. 21.

analysis. Specifically, this economic analysis quantifies incremental economic impact of frog conservation associated with urban development, agriculture, ranching, water management, timber harvest activities, transportation, utility and oil and gas pipeline construction and maintenance, fire management and public lands management. However, as described below, only incremental impacts to development and agriculture are expected to affect small entities.

232. Impacts are not expected to small entities in other economic sectors potentially affected by this rule for the following reasons:

- **Water Management (Chapter 5)** – Water management agencies in the study area may include small entities, but there are no incremental impacts expected to for water management activities.
- **Oil and Gas (Chapter 10)** – Oil and gas operators in the region may include small entities, but the incremental impacts to the oil and gas sector are anticipated to minimal and administrative in nature. Therefore, any potential impacts to small entities are expected to be minimal.

233. This analysis also concludes that the incremental impacts attributable to other activities (i.e., activities described in chapter 7-9 and chapters 11-12) are administrative and anticipated to be undertaken primarily by State and Federal agencies. Therefore, these impacts not expected to affect small entities (including small governments) and are omitted from further examination.

234. Incremental impacts to development and agriculture, however, may affect small entities. A description of the types and number of small entities potentially affected follows.

Urban Development (Chapter 4)

235. This analysis expects frog conservation efforts to affect small developers. Exhibit A-2 shows the total number of entities and the number of small entities engaged in development activities in the 28 counties of the study area. Based on Dun and Bradstreet data, nearly all developers are considered small. Out of the total number of entities engaged in single-family construction, multi-family construction, and land subdivision, 99 percent are small entities.

EXHIBIT A-2 TOTAL ENTITIES AND SMALL ENTITIES IN THE DEVELOPMENT INDUSTRY

NAICS CODE	DESCRIPTION	TOTAL NUMBER OF ENTITIES	NUMBER OF SMALL ENTITIES
236115	Single-Family Construction	32,996	32,860
236116	Multi-Family Construction	5,993	5,957
237210	Land Subdivision	7,655	7,423
TOTAL		**46,644**	**46,240**

Notes:
Size standard based on SBA's Table of Small Business Size Standards for NAICS 2002 (http://www.sba.gov/size/sizetable2002.pdf). Numbers of businesses are based on Dun and Bradstreet Business Information, "Dun's Market Identifiers," downloaded January 2009.

Agriculture (Chapter 6)

236. This analysis expects frog conservation efforts to affect small farmers. Exhibit A-3 shows the total number of small entities engaged in agricultural activities in the study area. To estimate the number of small farms potentially affected by the designation of critical habitat, this analysis employs the following steps:

- **Identify the acreage and value of cropland subject to incremental impacts.** The methodology to arrive at this acreage is indentified in section 6.1.
- **Identify the percent of small farmers by county.** Based on Dun and Bradstreet data, most farms in the counties that overlap the study area are small. Small businesses in crop production are defined as having annual revenue less than $750,000. Of the estimated 11,000 farms in the counties that overlap the study area, approximately 9,640 farms (or 88 percent) are considered to be small.

A.1.4 DESCRIPTION OF THE PROJECTED REPORTING, RECORDKEEPING, AND OTHER COMPLIANCE REQUIREMENTS OF THE RULE

237. Small entities represent 99 and 88 percent of entities affected by the critical habitat designation in development and agriculture, respectively. Potential impacts to these small entities are detailed below.

Urban Development

238. Chapter 4 of this analysis details the potential impacts of frog conservation efforts on urban development. The degree of impact on individual developers depends on the specific characteristics of a particular land parcel as well as the availability of land within the affected region. If land is not scarce in the affected region, the price of a specific parcel will likely incorporate any regulatory restrictions on that parcel. Therefore, any costs associated with conservation efforts for the frog will likely be reflected in the price paid for the parcel. In this case, the costs of frog conservation efforts are ultimately borne by the current landowner in the form of reduce land values. Many of these landowners may be individuals or families that are not registered businesses. No NAICS code exists for homeowners, and the SBA does not provide a definition of a small landowner.

EXHIBIT A-3 ESTIMATED NUMBER OF SMALL FARMS IN STUDY AREA BY COUNTY

COUNTY	AFFECTED ACRES	% SMALL BUSINESSES IN CROP PRODUCTION[1]	SMALL BUSINESS ACRES AFFECTED	MEDIAN SMALL FARM SIZE[2]	# OF SMALL BUSINESS AFFECTED
Contra Costa	1,723	89.9%	1,549	20	77
El Dorado	233	98.9%	230	17	14
Kern	2	81.5%	1	167	0
Marin	8,466	93.9%	7,950	361	22
Monterey	201	73.1%	147	155	1
Napa	232	89.4%	207	21	10
Nevada	72	98.4%	71	20	4
San Benito	1,782	79.0%	1,409	75	19
San Joaquin	43	88.9%	38	35	1
San Luis Obispo	13,366	90.6%	12,107	56	216
San Mateo	951	85.6%	814	40	20
Santa Barbara	1,088	83.6%	910	28	32
Santa Clara	680	87.5%	595	11	54
Santa Cruz	398	82.0%	326	15	22
Solano	7	86.3%	6	40	0
Sonoma	36	90.8%	33	20	2
Ventura	134	82.5%	111	20	6
Total	**29,413**				**499**

Notes:
(1) Size standard based on SBA's Table of Small Business Size Standards for NAICS 2002 (http://www.sba.gov/size/sizetable2002.pdf). Numbers of businesses are based on Dun and Bradstreet Business Information, "Dun's Market Identifiers," downloaded January 2009.
(2) As a result of some very large commercial farms, the number of acres per farm varies widely across the study area. Accordingly, this analysis uses the median farm size (rather than the average) to estimate the typical size of a small farm.

239. If, however, land in the affected region is scarce, or the characteristics of the specific parcel are unique, the price of a parcel may not incorporate regulatory restrictions associated with that parcel. In this case, the project developer may be required to incur the additional costs associated with frog conservation efforts. To understand the potential impacts on small entities, this analysis conservatively assumes that all of the private owners in developable lands affected by future frog conservation efforts will be developers. This assumption is likely to overstate the actual impacts to small development firms.

240. To estimate the magnitude of impact by frog conservation efforts on developers potentially affected, this analysis first estimates the number of developments potentially constructed within the timeframe of this analysis. Second, the analysis estimates the

number of developers required to undertake these projects and determines how many of those developers may be small. Lastly, the analysis determines the incremental impact that frog conservation efforts may have on the revenues of small developers. These steps are detailed below.

- **Estimate number of development projects affected by potentially affected by critical habitat designation.** This analysis assumes full build out of all acres identified as likely to be developed (as defined in Chapter 4) within the next 22 years. Specifically, over the next 22 years this analysis forecasts development in 2,124 acres in the study area where the frog would likely not be detected (Exhibit 4-5). Assuming a 100-acre average development size yields approximately 21 development projects over the next 22 years, or approximately one project annually.
- **Estimate number of developers required to construct potential developments and determine how many of those developers may be small**. This analysis assumes that one developer is required per development project. Because there are no known developers for future development projects, this analysis assumes that all developers are considered small. This assumption may overstate the impacts to small entities if some developers are not considered small.
- **Estimate the incremental impact of frog conservation efforts on small developers**. Over the next 22 years the incremental impact due to critical habitat designation is estimated to range from $25 million to $27 million, assuming a seven percent discount rate, per small developer. These costs are incurred from section 7 consultations, project modifications, and delay costs associated with section 7 consultation and the CEQA review process.

Agriculture

241. This analysis assumes that incremental impacts incurred by modifying agricultural activities will affect small farmers across the study area. As described in Chapter 6, a stipulated injunction issued by the U.S. District Court for the Northern District of California will restrict pesticide application in designated critical habitat. The analysis assumes that the affected lands will be taken out of production. To estimate the potential incremental impact on small farmers, the total cropland value by county (assumed to be taken out of production) was divided by the number of small farmers to estimate per-farm impacts. According to this analysis, the designation of critical habitat would affect 499 farms over the time horizon for the analysis. Total impacts are anticipated to range between $156 million and $169 million, or $313,000 to $338,000 per farm. Exhibit A-4 presents impacts by county, per small farmer.

EXHIBIT A-4 AGRICULTURAL IMPACTS TO SMALL BUSINESSES IN CROP PRODUCTION

COUNTY	# OF SMALL BUSINESS AFFECTED	TOTAL IMPACTS (2009-2030)		IMPACTS PER FARM	
		LOW	HIGH	LOW	HIGH
Contra Costa	77	$8,480,000	$8,860,000	$110,000	$114,000
El Dorado	14	$1,030,000	$1,200,000	$76,400	$88,500
Kern	0	$7,340	$7,750	$999,000	$1,050,000
Marin	22	$40,600,000	$43,600,000	$1,850,000	$1,980,000
Monterey	1	$4,550,000	$4,580,000	$4,800,000	$4,840,000
Napa	10	$5,900,000	$6,470,000	$597,000	$656,000
Nevada	4	$1,420,000	$2,020,000	$399,000	$567,000
San Benito	19	$6,560,000	$7,060,000	$349,000	$376,000
San Joaquin	1	$186,000	$230,000	$170,000	$210,000
San Luis Obispo	216	$26,800,000	$27,800,000	$124,000	$128,000
San Mateo	20	$17,100,000	$19,300,000	$838,000	$949,000
Santa Barbara	32	$11,300,000	$11,600,000	$347,000	$358,000
Santa Clara	54	$14,500,000	$16,200,000	$269,000	$299,000
Santa Cruz	22	$15,400,000	$16,900,000	$709,000	$780,000
Solano	0	$2,510	$8,610	$17,300	$59,400
Sonoma	2	$40,400	$46,000	$24,800	$28,200
Ventura	6	$2,630,000	$3,030,000	$476,000	$548,000
Total	**499**	**$156,000,000**	**$169,000,000**	**$313,000**	**$338,000**

A.1.5 IDENTIFICATION OF ALL RELEVANT FEDERAL RULES THAT MAY DUPLICATE, OVERLAP, OR CONFLICT WITH THE PROPOSED RULE

242. An IRFA must identify any duplicative, overlapping, and conflicting Federal rules. Rules are duplicative or overlapping if they are based on the same or similar reasons for the regulation, the same or similar regulatory goals, and if they regulate the same classes of industry. Rules are conflicting when they impose two conflicting regulatory requirements on the same classes of industry.

243. The protection of listed species and habitat may overlap other sections of the Act. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act. While the proposed critical habitat regulates activities that are Federally funded, authorized by a Federal agency, or carried out by a Federal agency, section 7 also requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species. The baseline conservation efforts quantified in this report overlaps with the jeopardy standard invoked by the listing of the species. The incremental impacts forecast in this report and contemplated in this IRFA

are expected to result from the critical habitat designation, however, and not other Federal rules.

A.1.6 A DESCRIPTION OF ALTERNATIVES TO THE PROPOSED RULE WHICH ACCOMPLISH THE OBJECTIVES AND WHICH MINIMIZE IMPACT ON SMALL ENTITIES

244. In the proposed rule the service identifies 50 units as potential critical habitat for the frog. Section 4(b)(2) of the Act allows the Service to exclude areas proposed for designation based on economic impact and other relevant impacts. As a result, designation of a sub-set of the critical habitat, as it is defined in the proposed rule, is available to the Service as an alternative.

A.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

245. Pursuant to E.O. No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy."[186]

246. OMB guidance for implementing this E.O., outlining nine outcomes that may constitute "a significant adverse effect" when compared with the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day;
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.[187]

247. As highlighted in Chapter 10 (Exhibits 10-2 and 10-3), a number of oil and gas companies own and operate pipelines that pass through the study area and Waste

[186] Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, http://www.whitehouse.gov/omb/memoranda/m01-27.html.

[187] Ibid.

Management and the Linde Group plan to build the world's largest landfill gas plant in ALA-2. The incremental impact to these entities over the next 22 years is solely attributable to the costs of section 7 consultation. No measurable impacts to the quantity or cost of energy production and distribution are likely to result from the proposed rule.

APPENDIX B | IMPACTS BY SUBUNIT

Appendix B provides detailed impacts by subunit. A subunit is defined by a unique combination of a proposed critical habitat unit and a census tract.

EXHIBIT B-1 POST-DESIGNATION BASELINE IMPACTS BY PROPOSED CRITICAL HABITAT SUBUNIT (2008 DOLLARS)

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-1A-6001430100	$6,530,000	$6,870,000	$4,530,000	$4,770,000	$499,000	$520,000	$418,000	$440,000
ALA-1A-6001450500	$82,100,000	$84,900,000	$57,000,000	$59,000,000	$5,900,000	$6,080,000	$5,220,000	$5,400,000
ALA-1A-6013345110	$200	$200	$139	$139	$13	$13	$13	$13
ALA-1B-6001435101	$28,200,000	$29,400,000	$19,600,000	$20,400,000	$2,080,000	$2,160,000	$1,800,000	$1,880,000
ALA-1B-6001438000	$308	$308	$214	$214	$19	$19	$19	$19
ALA-1B-6001440100	$32,500	$34,500	$22,500	$23,900	$2,570	$2,700	$2,090	$2,220
ALA-1B-6001450601	$34,900,000	$35,700,000	$24,200,000	$24,800,000	$2,420,000	$2,470,000	$2,210,000	$2,260,000
ALA-2-6001450701	$637,000	$687,000	$442,000	$477,000	$44,100	$47,300	$40,400	$43,500
ALA-2-6001451101	$166,000,000	$173,000,000	$115,000,000	$120,000,000	$12,400,000	$12,900,000	$10,600,000	$11,100,000
ALA-2-6077005203	$1,540,000	$1,980,000	$1,070,000	$1,380,000	$189,000	$216,000	$105,000	$133,000
ALA-2-6077005500	$6,800,000	$8,200,000	$4,730,000	$5,700,000	$775,000	$863,000	$461,000	$549,000
ALA-2-6085504308	$50	$126	$35	$88	$3	$8	$3	$8
ALA-2-6085504417	$314,000	$328,000	$218,000	$228,000	$23,400	$24,300	$20,100	$21,000
ALA-2-6085512700	$4,830,000	$5,040,000	$3,350,000	$3,500,000	$354,000	$367,000	$308,000	$321,000
BUT-1-6007002400	$212,000	$212,000	$147,000	$147,000	$13,300	$13,300	$13,300	$13,300
CAL-1-6009000210	$9,040,000	$12,200,000	$6,280,000	$8,440,000	$1,390,000	$1,590,000	$647,000	$842,000
CAL-1-6009000300	$3	$3	$2	$2	$0	$0	$0	$0
CCS-1-6013347000	$12,700	$14,300	$8,930	$10,100	$795	$900	$807	$912
CCS-1-6013356002	$7,300,000	$2,220,000	$5,070,000	$1,550,000	$468,000	$149,000	$459,000	$141,000
CCS-1-6013359202	$4,660	$4,660	$3,300	$3,300	$292	$292	$298	$298
CCS-1-6013360100	$465	$465	$323	$323	$29	$29	$29	$29
CCS-2-6001450100	$65	$66	$45	$46	$4	$4	$4	$4
CCS-2-6001450721	$66,500,000	$70,300,000	$46,100,000	$48,800,000	$5,160,000	$5,400,000	$4,270,000	$4,510,000
CCS-2-6001451101	$239,000,000	$250,000,000	$166,000,000	$173,000,000	$17,900,000	$18,600,000	$15,300,000	$15,900,000
CCS-2-6001451202	$12,800,000	$13,700,000	$8,880,000	$9,600,000	$994,000	$1,050,000	$821,000	$886,000
CCS-2-6013303200	$50,300,000	$57,800,000	$34,900,000	$40,100,000	$5,030,000	$5,500,000	$3,340,000	$3,810,000
CCS-2-6013304000	$42,900,000	$44,700,000	$29,900,000	$31,100,000	$2,830,000	$2,940,000	$2,710,000	$2,830,000
CCS-2-6013313103	$7,280,000	$8,630,000	$5,060,000	$5,990,000	$787,000	$872,000	$489,000	$573,000
CCS-2-6013313202	$25,800,000	$29,200,000	$17,900,000	$20,200,000	$2,480,000	$2,690,000	$1,700,000	$1,910,000

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
CCS-2-6013346101	$9,590,000	$9,910,000	$6,660,000	$6,880,000	$687,000	$707,000	$610,000	$630,000
CCS-2-6013346102	$862,000	$888,000	$599,000	$616,000	$60,900	$62,500	$54,800	$56,400
CCS-2-6013346201	$1,880	$1,890	$1,370	$1,380	$118	$119	$124	$125
CCS-2-6013355104	$258,000,000	$270,000,000	$179,000,000	$188,000,000	$19,200,000	$19,900,000	$16,500,000	$17,300,000
CCS-2-6013355106	$66,900,000	$75,500,000	$46,500,000	$52,500,000	$6,250,000	$6,790,000	$4,400,000	$4,940,000
CCS-2-6013355200	$3,880,000	$4,470,000	$2,700,000	$3,110,000	$399,000	$436,000	$259,000	$296,000
CCS-2-6013355303	$1,930,000	$2,030,000	$1,340,000	$1,410,000	$145,000	$150,000	$124,000	$130,000
CCS-2-6013355304	$10,400,000	$11,200,000	$7,240,000	$7,760,000	$854,000	$901,000	$674,000	$721,000
ELD-1-6017031302	$0	$0	$0	$0	$0	$0	$0	$0
ELD-1-6017031405	$9,010,000	$10,300,000	$6,260,000	$7,160,000	$916,000	$998,000	$599,000	$681,000
ELD-1-6017031406	$2,070,000	$2,430,000	$1,440,000	$1,690,000	$210,000	$233,000	$138,000	$160,000
LOS-1-6037920014	$24,300	$24,300	$16,900	$16,900	$1,520	$1,520	$1,520	$1,520
LOS-1-6037920103	$36,300	$36,300	$25,200	$25,200	$2,280	$2,280	$2,280	$2,280
MEN-1-6045011100	$162,000	$170,000	$113,000	$118,000	$12,300	$12,900	$10,400	$10,900
MNT-1-6053010202	$4,930	$4,930	$3,420	$3,420	$309	$309	$309	$309
MNT-1-6053010304	$74,200	$159,000	$51,500	$111,000	$4,660	$10,000	$4,660	$10,000
MNT-2-6053010702	$46	$77	$32	$53	$3	$5	$3	$5
MNT-2-6053010801	$131	$216	$91	$150	$8	$14	$8	$14
MNT-2-6053011000	$20,100,000	$20,400,000	$13,900,000	$14,100,000	$1,260,000	$1,280,000	$1,260,000	$1,280,000
MNT-2-6053011101	$2,340,000	$2,690,000	$1,620,000	$1,870,000	$147,000	$169,000	$147,000	$169,000
MNT-2-6053011500	$260	$287	$181	$199	$16	$18	$16	$18
MNT-2-6053011600	$24,600,000	$25,600,000	$17,100,000	$17,900,000	$1,540,000	$1,610,000	$1,550,000	$1,620,000
MNT-2-6053011700	$150,000	$360,000	$129,000	$331,000	$9,410	$22,600	$11,600	$29,900
MNT-2-6053013200	$1,740,000	$1,820,000	$1,210,000	$1,260,000	$131,000	$136,000	$111,000	$116,000
MNT-3-6053011000	$273	$273	$190	$190	$17	$17	$17	$17
MNT-3-6053011500	$7,810,000	$7,810,000	$5,430,000	$5,430,000	$490,000	$490,000	$490,000	$491,000
MRN-1-6041133000	$31,800,000	$32,100,000	$22,200,000	$22,400,000	$2,030,000	$2,060,000	$2,010,000	$2,030,000
MRN-1-6097154302	$36	$36	$26	$26	$2	$2	$2	$2
MRN-2-6041133000	$5,100,000	$4,870,000	$3,550,000	$3,400,000	$323,000	$310,000	$321,000	$307,000
MRN-3-6041132200	$2,850,000	$3,030,000	$1,980,000	$2,110,000	$208,000	$219,000	$182,000	$194,000

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
MRN-3-6041133000	$69,100	$192,000	$48,100	$134,000	$4,340	$12,100	$4,350	$12,100
NAP-1-6055201400	$2,150,000	$2,160,000	$1,490,000	$1,500,000	$141,000	$142,000	$135,000	$136,000
NAP-1-6055201800	$2,050,000	$2,670,000	$1,420,000	$1,850,000	$131,000	$170,000	$129,000	$168,000
NEV-1-6057000801	$8,610,000	$9,090,000	$5,980,000	$6,310,000	$714,000	$745,000	$557,000	$588,000
NEV-1-6057000900	$354	$354	$246	$246	$22	$22	$22	$22
PLA-1-6061020200	$736,000	$869,000	$511,000	$603,000	$81,400	$89,800	$49,600	$57,900
RIV-1-6065043224	$6,800,000	$7,430,000	$4,730,000	$5,170,000	$556,000	$596,000	$440,000	$480,000
SCZ-1-6081613800	$23,700,000	$24,300,000	$16,500,000	$16,900,000	$1,570,000	$1,610,000	$1,500,000	$1,530,000
SCZ-1-6087100400	$3,040,000	$3,510,000	$2,100,000	$2,390,000	$256,000	$286,000	$196,000	$223,000
SCZ-1-6087100500	$74,600,000	$80,800,000	$51,800,000	$56,100,000	$6,320,000	$6,710,000	$4,840,000	$5,230,000
SCZ-1-6087101200	$54,500,000	$57,600,000	$37,800,000	$40,000,000	$4,250,000	$4,440,000	$3,500,000	$3,700,000
SCZ-1-6087120200	$122,000,000	$124,000,000	$84,500,000	$86,400,000	$8,470,000	$8,640,000	$7,720,000	$7,890,000
SCZ-1-6087120301	$234	$325	$163	$226	$15	$20	$15	$20
SCZ-1-6087120400	$163	$243	$113	$169	$10	$15	$10	$15
SCZ-1-6087120500	$51	$69	$36	$48	$3	$4	$3	$4
SCZ-1-6087120700	$6,730	$6,900	$4,670	$4,790	$423	$433	$423	$433
SCZ-2-6087110400	$32,700	$263,000	$22,700	$183,000	$2,050	$16,500	$2,050	$16,500
SCZ-2-6087122300	$203,000,000	$215,000,000	$141,000,000	$149,000,000	$15,300,000	$16,000,000	$13,000,000	$13,800,000
SLO-1-6029004500	$38,500	$67,900	$27,000	$47,300	$3,330	$5,170	$2,520	$4,370
SLO-1-6053011400	$27	$75	$19	$52	$2	$5	$2	$5
SLO-1-6079010300	$14,700,000	$16,100,000	$10,200,000	$11,200,000	$1,290,000	$1,380,000	$958,000	$1,050,000
SLO-2-6079010000	$3,080	$3,380	$2,140	$2,350	$193	$212	$193	$212
SLO-2-6079010400	$66,800,000	$69,900,000	$46,300,000	$48,500,000	$5,020,000	$5,210,000	$4,270,000	$4,460,000
SLO-2-6079010500	$4,030,000	$4,190,000	$2,800,000	$2,910,000	$292,000	$302,000	$257,000	$267,000
SLO-2-6079010800	$23,400,000	$23,100,000	$16,400,000	$16,200,000	$1,470,000	$1,450,000	$1,480,000	$1,460,000
SLO-3-6079010500	$11,900,000	$12,400,000	$8,290,000	$8,630,000	$868,000	$899,000	$761,000	$791,000
SLO-3-6079010600	$13,300,000	$13,800,000	$9,220,000	$9,570,000	$981,000	$1,010,000	$848,000	$879,000
SLO-3-6079010800	$3,250,000	$3,270,000	$2,280,000	$2,290,000	$204,000	$205,000	$206,000	$207,000
SLO-3-6079010901	$7,050,000	$7,370,000	$4,900,000	$5,120,000	$524,000	$544,000	$451,000	$470,000
SLO-3-6079010902	$668,000	$710,000	$464,000	$493,000	$53,000	$55,700	$43,000	$45,700

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
SLO-3-6079011000	$14,000,000	$14,800,000	$9,730,000	$10,400,000	$1,050,000	$1,100,000	$896,000	$955,000
SLO-3-6079011101	$441	$1,010	$306	$701	$28	$63	$28	$63
SLO-3-6079011102	$10	$22	$7	$15	$1	$1	$1	$1
SLO-3-6079011200	$27,900,000	$29,200,000	$19,400,000	$20,300,000	$2,100,000	$2,180,000	$1,790,000	$1,870,000
SLO-3-6079011400	$316,000	$318,000	$221,000	$223,000	$20,300	$20,500	$20,000	$20,200
SLO-3-6079011502	$20,100,000	$20,800,000	$14,000,000	$14,400,000	$1,450,000	$1,490,000	$1,280,000	$1,320,000
SLO-3-6079012702	$44,000,000	$45,700,000	$30,600,000	$31,800,000	$3,230,000	$3,350,000	$2,810,000	$2,920,000
SLO-3-6079012704	$9,080,000	$9,520,000	$6,300,000	$6,610,000	$684,000	$712,000	$581,000	$608,000
SLO-4-6079011502	$56	$56	$39	$39	$4	$4	$4	$4
SLO-4-6079012302	$1,930	$1,930	$1,340	$1,340	$121	$121	$121	$121
SLO-4-6079012702	$85,100	$85,100	$61,500	$61,500	$5,340	$5,340	$5,560	$5,560
SNB-1-6053010606	$16	$16	$11	$11	$1	$1	$1	$1
SNB-1-6069000200	$11,200	$13,600	$7,750	$9,460	$701	$855	$701	$855
SNB-1-6069000800	$9,330,000	$9,580,000	$6,510,000	$6,680,000	$613,000	$628,000	$591,000	$607,000
SNB-2-6069000800	$276,000	$356,000	$194,000	$249,000	$17,400	$22,400	$17,500	$22,500
SNB-3-6053011102	$463	$484	$321	$336	$29	$30	$29	$30
SNB-3-6053011201	$204	$206	$142	$143	$13	$13	$13	$13
SNB-3-6069000800	$306,000	$374,000	$217,000	$264,000	$21,500	$25,800	$19,900	$24,100
SNM-1-6081603000	$2	$5	$2	$4	$0	$0	$0	$0
SNM-1-6081603100	$1,230,000	$1,260,000	$857,000	$877,000	$84,900	$86,800	$78,200	$80,000
SNM-1-6081603200	$3,350,000	$3,450,000	$2,320,000	$2,400,000	$238,000	$245,000	$213,000	$219,000
SNM-1-6081603300	$1,390,000	$1,450,000	$962,000	$1,000,000	$103,000	$107,000	$88,500	$92,300
SNM-1-6081603400	$101,000	$107,000	$69,800	$74,400	$7,260	$7,670	$6,400	$6,820
SNM-1-6081603500	$266	$466	$185	$324	$17	$29	$17	$29
SNM-1-6081603600	$1,460,000	$1,520,000	$1,010,000	$1,050,000	$107,000	$111,000	$93,000	$96,800
SNM-1-6081613501	$4,210,000	$4,290,000	$2,930,000	$2,980,000	$264,000	$270,000	$264,000	$270,000
SNM-1-6081613502	$14,500,000	$15,500,000	$10,100,000	$10,700,000	$1,050,000	$1,110,000	$923,000	$984,000
SNM-1-6081613600	$3,600,000	$3,780,000	$2,500,000	$2,620,000	$266,000	$278,000	$230,000	$241,000
SNM-1-6081613700	$9,340,000	$9,520,000	$6,490,000	$6,610,000	$644,000	$655,000	$592,000	$603,000
SNM-2-6081613200	$16	$16	$11	$11	$1	$1	$1	$1

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
SNM-2-6081613400	$15,600	$15,600	$10,800	$10,800	$977	$977	$977	$977
SNM-2-6081613700	$127,000	$130,000	$87,800	$90,100	$8,820	$9,030	$8,020	$8,230
SNM-2-6081613800	$123,000,000	$129,000,000	$85,600,000	$89,800,000	$8,580,000	$8,970,000	$7,820,000	$8,200,000
SNM-2-6085511703	$6	$6	$4	$4	$0	$0	$0	$0
SNM-2-6087120200	$7,540	$7,970	$5,240	$5,530	$585	$612	$484	$511
SNM-2-6087120500	$106	$106	$73	$73	$7	$7	$7	$7
SOL-1-6055201002	$69,200	$83,600	$48,000	$58,000	$8,070	$8,970	$4,700	$5,600
SOL-1-6095250102	$4,060,000	$4,990,000	$2,820,000	$3,470,000	$498,000	$557,000	$278,000	$337,000
SOL-1-6095252102	$323,000	$386,000	$224,000	$268,000	$31,900	$35,900	$21,400	$25,300
SOL-1-6095252104	$6	$16	$4	$11	$0	$1	$0	$1
SOL-1-6095252202	$3,250,000	$4,030,000	$2,260,000	$2,800,000	$398,000	$447,000	$223,000	$272,000
SOL-2-6055201002	$21,200	$55,200	$14,700	$38,300	$1,330	$3,460	$1,330	$3,460
SOL-2-6095252201	$1,310,000	$1,680,000	$910,000	$1,170,000	$167,000	$191,000	$90,400	$114,000
SOL-3-6055201002	$11,000,000	$12,800,000	$7,640,000	$8,900,000	$833,000	$947,000	$704,000	$818,000
SOL-3-6095252201	$5,280,000	$6,630,000	$3,670,000	$4,600,000	$680,000	$764,000	$365,000	$449,000
SON-1-6097151503	$200,000	$227,000	$139,000	$157,000	$19,300	$20,900	$13,200	$14,900
SON-1-6097151600	$142,000	$146,000	$99,700	$102,000	$8,890	$9,140	$9,010	$9,270
SON-2-6097150303	$954	$954	$662	$662	$60	$60	$60	$60
SON-2-6097150500	$5,020	$5,920	$3,480	$4,110	$555	$612	$338	$395
SON-2-6097150606	$26,000	$28,700	$18,100	$19,900	$2,340	$2,510	$1,700	$1,870
SON-2-6097151309	$242,000	$285,000	$168,000	$198,000	$25,400	$28,100	$16,200	$18,900
SON-3-6041133000	$4,390,000	$4,580,000	$3,060,000	$3,190,000	$286,000	$298,000	$277,000	$289,000
SON-3-6097150800	$2,550,000	$2,990,000	$1,770,000	$2,080,000	$274,000	$302,000	$171,000	$199,000
SON-3-6097151100	$39,200	$44,200	$27,200	$30,700	$3,780	$4,090	$2,590	$2,900
STB-1-6083001800	$55,600	$55,600	$38,600	$38,600	$3,490	$3,490	$3,490	$3,490
STB-2-6083002006	$12,700,000	$13,700,000	$8,800,000	$9,540,000	$966,000	$1,030,000	$812,000	$879,000
STB-2-6083002500	$7,540,000	$7,740,000	$5,240,000	$5,380,000	$505,000	$518,000	$477,000	$490,000
STB-2-6083002603	$42,300	$43,100	$31,100	$31,600	$2,650	$2,700	$2,810	$2,860
STB-3-6083001800	$64,000	$64,000	$46,300	$46,300	$4,020	$4,020	$4,190	$4,190
STB-3-6083001901	$6,210	$6,210	$4,310	$4,310	$390	$390	$390	$390

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
STB-3-6083001905	$34,100	$34,100	$25,100	$25,100	$2,140	$2,140	$2,270	$2,270
STB-4-6083002603	$19,600	$19,600	$13,600	$13,600	$1,230	$1,230	$1,230	$1,230
STB-4-6083002805	$25,100	$25,100	$17,400	$17,400	$1,570	$1,570	$1,570	$1,570
STB-5-6083001906	$42,300	$60,900	$29,300	$42,300	$3,000	$4,170	$2,680	$3,850
STB-5-6083002805	$175,000	$508,000	$139,000	$409,000	$11,000	$31,900	$12,600	$37,000
STB-5-6083002910	$60,600	$69,900	$42,000	$48,500	$4,600	$5,190	$3,880	$4,460
STB-6-6083001906	$2,800	$6,630	$1,950	$4,600	$176	$416	$176	$416
STB-6-6083002910	$19,100,000	$19,700,000	$13,300,000	$13,700,000	$1,370,000	$1,400,000	$1,220,000	$1,250,000
STB-7-6083000103	$111	$215	$77	$149	$7	$14	$7	$14
STB-7-6083000501	$9	$9	$6	$6	$1	$1	$1	$1
STB-7-6083000700	$18	$33	$12	$23	$1	$2	$1	$2
STB-7-6083001500	$55	$55	$38	$38	$3	$3	$3	$3
STB-7-6083001701	$5,820	$6,330	$4,040	$4,400	$365	$397	$365	$397
STB-7-6083001800	$192,000	$249,000	$142,000	$181,000	$12,100	$15,600	$12,800	$16,400
STB-7-6083001906	$43,600	$58,500	$30,300	$40,600	$3,070	$4,000	$2,770	$3,700
STB-7-6083002907	$11	$11	$7	$7	$1	$1	$1	$1
STB-7-6083002910	$8	$8	$6	$6	$1	$1	$1	$1
STB-7-6111000100	$40,400	$48,700	$28,000	$33,800	$2,530	$3,050	$2,530	$3,050
STC-1-6085503312	$279,000	$280,000	$194,000	$194,000	$17,500	$17,600	$17,500	$17,600
STC-1-6085503319	$354	$456	$245	$316	$22	$29	$22	$29
STC-1-6085504201	$43	$101	$30	$70	$3	$6	$3	$6
STC-1-6085504202	$745,000	$779,000	$517,000	$541,000	$55,200	$57,400	$47,600	$49,700
STC-1-6085504308	$64,600	$70,500	$44,800	$48,900	$5,120	$5,480	$4,160	$4,520
STC-1-6085512100	$58	$138	$41	$96	$4	$9	$4	$9
STC-1-6085512402	$9	$23	$7	$16	$1	$1	$1	$1
STC-1-6085512700	$30,600,000	$30,700,000	$21,200,000	$21,300,000	$2,040,000	$2,040,000	$1,930,000	$1,940,000
STC-2-6047002100	$264,000	$425,000	$183,000	$295,000	$55,100	$65,200	$20,200	$30,400
STC-2-6069000100	$1,340,000	$1,570,000	$928,000	$1,090,000	$111,000	$126,000	$86,500	$101,000
STC-2-6085512402	$17,200	$17,500	$11,900	$12,100	$1,150	$1,170	$1,080	$1,100
STC-2-6085512602	$33,500	$33,400	$23,500	$23,400	$2,380	$2,380	$2,150	$2,150

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
STC-2-6085512700	$60,400,000	$61,600,000	$41,900,000	$42,800,000	$4,280,000	$4,360,000	$3,840,000	$3,920,000
STC-2-6099003400	$17,300	$19,500	$12,000	$13,600	$1,440	$1,580	$1,120	$1,260
VEN-1-6111000902	$16,600,000	$17,000,000	$11,500,000	$11,800,000	$1,060,000	$1,080,000	$1,040,000	$1,070,000
VEN-1-6111001001	$740,000	$1,200,000	$514,000	$832,000	$46,500	$75,200	$46,500	$75,200
VEN-1-6111001101	$108,000	$215,000	$74,800	$149,000	$6,770	$13,500	$6,760	$13,500
VEN-1-6111001102	$3,690	$4,370	$2,570	$3,040	$232	$274	$232	$274
VEN-1-6111001204	$746	$1,780	$518	$1,240	$47	$112	$47	$112
VEN-2-6037920104	$19,500	$19,500	$13,500	$13,500	$1,220	$1,220	$1,220	$1,220
VEN-2-6111000100	$42,900	$42,900	$29,800	$29,800	$2,690	$2,690	$2,690	$2,690
VEN-3-6037800201	$6	$16	$4	$11	$0	$1	$0	$1
VEN-3-6037800302	$1	$1	$1	$1	$0	$0	$0	$0
VEN-3-6111007404	$5,070,000	$5,120,000	$3,520,000	$3,550,000	$318,000	$321,000	$318,000	$321,000
VEN-3-6111007503	$22,000	$44,900	$15,300	$31,200	$1,380	$2,820	$1,380	$2,820
VEN-3-6111007506	$236	$671	$164	$466	$15	$42	$15	$42
YUB-1-6115041100	$1,450,000	$1,580,000	$1,010,000	$1,100,000	$126,000	$134,000	$94,300	$103,000
Total	**$2,380,000,000**	**$2,500,000,000**	**$1,650,000,000**	**$1,740,000,000**	**$180,000,000**	**$188,000,000**	**$152,000,000**	**$160,000,000**

EXHIBIT B-2 POST-DESIGNATION INCREMENTAL IMPACTS BY PROPOSED CRITICAL HABITAT SUBUNIT (2008 DOLLARS)

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
ALA-1A-6001430100	$5,200,000	$5,450,000	$3,610,000	$3,780,000	$455,000	$470,000	$338,000	$354,000
ALA-1A-6001450500	$1,190,000	$1,220,000	$824,000	$849,000	$339,000	$342,000	$99,900	$102,000
ALA-1A-6013345110	$84	$84	$58	$58	$5	$5	$5	$5
ALA-1B-6001435101	$67,900,000	$70,600,000	$47,200,000	$49,000,000	$5,410,000	$5,570,000	$4,370,000	$4,540,000
ALA-1B-6001438000	$86	$86	$60	$60	$5	$5	$5	$5
ALA-1B-6001440100	$1,750	$1,750	$1,210	$1,210	$288	$288	$127	$127
ALA-1B-6001450601	$6,790,000	$6,950,000	$4,710,000	$4,820,000	$565,000	$575,000	$440,000	$449,000
ALA-2-6001450701	$1,120,000	$1,140,000	$775,000	$793,000	$81,700	$83,400	$71,200	$72,800
ALA-2-6001451101	$120,000,000	$125,000,000	$83,000,000	$86,500,000	$10,200,000	$10,500,000	$7,760,000	$8,080,000
ALA-2-6077005203	$471	$471	$328	$328	$30,700	$30,700	$2,970	$2,970
ALA-2-6077005500	$1,650,000	$2,260,000	$1,140,000	$1,570,000	$439,000	$478,000	$136,000	$174,000
ALA-2-6085504308	$571,000	$605,000	$396,000	$420,000	$49,300	$51,400	$37,100	$39,200
ALA-2-6085504417	$127	$127	$88	$88	$1,240	$1,240	$126	$126
ALA-2-6085512700	$6,160,000	$6,390,000	$4,280,000	$4,430,000	$494,000	$508,000	$397,000	$411,000
BUT-1-6007002400	$3,700	$3,700	$2,570	$2,570	$232	$232	$232	$232
CAL-1-6009000210	$8,740,000	$12,400,000	$6,060,000	$8,610,000	$2,280,000	$2,510,000	$715,000	$945,000
CAL-1-6009000300	$8,720	$12,500	$6,050	$8,700	$2,060	$2,300	$692	$931
CCS-1-6013347000	$3,450,000	$3,570,000	$2,400,000	$2,480,000	$262,000	$270,000	$221,000	$228,000
CCS-1-6013356002	$2,350,000	$2,530,000	$1,630,000	$1,760,000	$202,000	$214,000	$153,000	$164,000
CCS-1-6013359202	$2,170	$2,170	$1,530	$1,530	$136	$136	$138	$138
CCS-1-6013360100	$23	$23	$16	$16	$1	$1	$1	$1
CCS-2-6001450100	$2	$2	$1	$1	$0	$0	$0	$0
CCS-2-6001450721	$793,000	$835,000	$551,000	$579,000	$395,000	$398,000	$82,900	$85,500
CCS-2-6001451101	$18,000,000	$18,800,000	$12,500,000	$13,000,000	$2,400,000	$2,450,000	$1,250,000	$1,300,000
CCS-2-6001451202	$187,000	$196,000	$131,000	$137,000	$80,100	$80,700	$18,400	$19,000
CCS-2-6013303200	$15,000,000	$17,700,000	$10,400,000	$12,300,000	$2,640,000	$2,810,000	$1,100,000	$1,270,000
CCS-2-6013304000	$1,210,000	$1,460,000	$838,000	$1,010,000	$223,000	$239,000	$89,900	$106,000
CCS-2-6013313103	$966,000	$1,150,000	$670,000	$799,000	$244,000	$256,000	$78,200	$89,800
CCS-2-6013313202	$640,000	$718,000	$444,000	$499,000	$357,000	$362,000	$70,600	$75,500

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
CCS-2-6013346101	$553	$553	$384	$384	$28,300	$28,300	$2,740	$2,740
CCS-2-6013346102	$124,000	$127,000	$86,100	$88,400	$11,400	$11,600	$8,120	$8,330
CCS-2-6013346201	$302	$302	$231	$231	$19	$19	$21	$21
CCS-2-6013355104	$49,700,000	$52,600,000	$34,500,000	$36,500,000	$5,090,000	$5,280,000	$3,310,000	$3,490,000
CCS-2-6013355106	$1,750,000	$2,220,000	$1,220,000	$1,540,000	$979,000	$1,010,000	$193,000	$222,000
CCS-2-6013355200	$1,080,000	$1,250,000	$753,000	$871,000	$187,000	$198,000	$79,500	$90,100
CCS-2-6013355303	$498,000	$528,000	$346,000	$367,000	$50,900	$52,700	$33,200	$35,000
CCS-2-6013355304	$1,010	$1,010	$700	$700	$66,500	$66,500	$6,430	$6,430
ELD-1-6017031302	$275	$10,200	$191	$7,090	$17	$641	$17	$641
ELD-1-6017031405	$12,400,000	$14,300,000	$8,580,000	$9,900,000	$1,580,000	$1,690,000	$853,000	$972,000
ELD-1-6017031406	$3,010,000	$3,500,000	$2,090,000	$2,430,000	$395,000	$427,000	$208,000	$240,000
LOS-1-6037920014	$3,110	$3,110	$2,160	$2,160	$195	$195	$195	$195
LOS-1-6037920103	$4,070	$4,070	$2,820	$2,820	$255	$255	$255	$255
MEN-1-6045011100	$13,200,000	$14,500,000	$9,170,000	$10,000,000	$1,320,000	$1,400,000	$877,000	$955,000
MNT-1-6053010202	$23	$23	$16	$16	$1	$1	$1	$1
MNT-1-6053010304	$114	$114	$79	$79	$7	$7	$7	$7
MNT-2-6053010702	$10	$10	$7	$7	$1	$1	$1	$1
MNT-2-6053010801	$4,530	$6,700	$3,150	$4,650	$284	$420	$284	$420
MNT-2-6053011000	$7,670,000	$7,770,000	$5,330,000	$5,400,000	$481,000	$488,000	$481,000	$488,000
MNT-2-6053011101	$3,150,000	$3,570,000	$2,190,000	$2,480,000	$198,000	$224,000	$198,000	$224,000
MNT-2-6053011500	$688	$739	$477	$513	$43	$46	$43	$46
MNT-2-6053011600	$33,100,000	$34,200,000	$23,000,000	$23,700,000	$2,080,000	$2,150,000	$2,080,000	$2,150,000
MNT-2-6053011700	$3,840	$3,840	$3,670	$3,670	$241	$241	$332	$332
MNT-2-6053013200	$236,000	$246,000	$164,000	$171,000	$26,100	$26,800	$15,900	$16,500
MNT-3-6053011000	$29	$29	$20	$20	$2	$2	$2	$2
MNT-3-6053011500	$113,000	$121,000	$79,000	$84,600	$7,080	$7,590	$7,140	$7,650
MRN-1-6041133000	$9,600,000	$10,400,000	$6,670,000	$7,200,000	$635,000	$683,000	$606,000	$654,000
MRN-1-6097154302	$2	$2	$1	$1	$0	$0	$0	$0
MRN-2-6041133000	$52,300,000	$55,400,000	$36,300,000	$38,500,000	$3,350,000	$3,550,000	$3,290,000	$3,480,000
MRN-3-6041132200	$2,310,000	$2,940,000	$1,600,000	$2,040,000	$192,000	$232,000	$149,000	$189,000

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
MRN-3-6041133000	$8	$11,900	$6	$8,260	$0	$746	$1	$746
NAP-1-6055201400	$93,500	$148,000	$65,000	$103,000	$9,130	$12,500	$6,180	$9,600
NAP-1-6055201800	$39,600	$108,000	$27,500	$74,700	$4,240	$8,500	$2,660	$6,920
NEV-1-6057000801	$9,760,000	$11,600,000	$6,780,000	$8,060,000	$1,060,000	$1,180,000	$656,000	$772,000
NEV-1-6057000900	$0	$0	$0	$0	$0	$0	$0	$0
PLA-1-6061020200	$21,400	$21,400	$14,900	$14,900	$13,100	$13,100	$2,470	$2,470
RIV-1-6065043224	$109,000	$143,000	$75,900	$99,300	$63,400	$65,500	$12,300	$14,400
SCZ-1-6081613800	$1,130,000	$1,430,000	$784,000	$990,000	$109,000	$128,000	$74,600	$93,200
SCZ-1-6087100400	$2,660	$2,660	$1,330	$1,330	$22,000	$22,000	$2,210	$2,210
SCZ-1-6087100500	$8,320	$8,320	$5,800	$5,800	$548,000	$548,000	$53,000	$53,000
SCZ-1-6087101200	$4,320	$4,320	$3,010	$3,010	$275,000	$275,000	$26,600	$26,600
SCZ-1-6087120200	$42,100,000	$44,500,000	$29,200,000	$30,900,000	$3,640,000	$3,790,000	$2,740,000	$2,890,000
SCZ-1-6087120301	$62,200	$67,100	$43,200	$46,600	$5,850	$6,160	$4,090	$4,400
SCZ-1-6087120400	$1,110,000	$1,660,000	$768,000	$1,150,000	$71,700	$106,000	$69,700	$104,000
SCZ-1-6087120500	$13	$13	$9	$9	$1	$1	$1	$1
SCZ-1-6087120700	$283	$283	$196	$196	$18	$18	$18	$18
SCZ-2-6087110400	$3	$3	$2	$2	$0	$0	$0	$0
SCZ-2-6087122300	$3,990,000	$5,250,000	$2,770,000	$3,640,000	$1,140,000	$1,220,000	$336,000	$415,000
SLO-1-6029004500	$57,800	$97,000	$40,200	$67,400	$19,300	$21,700	$5,130	$7,590
SLO-1-6053011400	$5,920	$6,390	$4,110	$4,440	$372	$401	$372	$401
SLO-1-6079010300	$11,100,000	$12,400,000	$7,690,000	$8,620,000	$1,240,000	$1,330,000	$748,000	$832,000
SLO-2-6079010000	$301,000	$315,000	$209,000	$218,000	$24,200	$25,000	$19,400	$20,200
SLO-2-6079010400	$51,600,000	$53,900,000	$35,800,000	$37,400,000	$4,400,000	$4,540,000	$3,350,000	$3,490,000
SLO-2-6079010500	$72,500	$75,100	$50,300	$52,100	$18,700	$18,800	$5,900	$6,070
SLO-2-6079010800	$16,900,000	$17,300,000	$11,700,000	$12,000,000	$1,060,000	$1,090,000	$1,060,000	$1,090,000
SLO-3-6079010500	$320,000	$332,000	$222,000	$230,000	$64,200	$64,900	$24,300	$25,000
SLO-3-6079010600	$24,800,000	$25,900,000	$17,200,000	$18,000,000	$2,010,000	$2,090,000	$1,600,000	$1,670,000
SLO-3-6079010800	$9,100,000	$9,160,000	$6,320,000	$6,360,000	$571,000	$575,000	$571,000	$575,000
SLO-3-6079010901	$3,620,000	$3,730,000	$2,510,000	$2,590,000	$298,000	$305,000	$234,000	$241,000
SLO-3-6079010902	$149	$149	$111	$111	$3,720	$3,720	$365	$365

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
SLO-3-6079011000	$584,000	$610,000	$406,000	$425,000	$104,000	$106,000	$43,200	$44,900
SLO-3-6079011101	$7,290	$7,290	$5,060	$5,060	$457	$457	$457	$457
SLO-3-6079011102	$2	$2	$1	$1	$0	$0	$0	$0
SLO-3-6079011200	$33,200,000	$34,700,000	$23,100,000	$24,100,000	$2,780,000	$2,870,000	$2,150,000	$2,240,000
SLO-3-6079011400	$114	$114	$89	$89	$172	$172	$24	$24
SLO-3-6079011502	$3,190,000	$3,360,000	$2,220,000	$2,330,000	$298,000	$308,000	$210,000	$220,000
SLO-3-6079012702	$52,700,000	$55,200,000	$36,500,000	$38,300,000	$4,300,000	$4,460,000	$3,400,000	$3,560,000
SLO-3-6079012704	$18,600,000	$19,400,000	$12,900,000	$13,500,000	$1,530,000	$1,580,000	$1,200,000	$1,250,000
SLO-4-6079011502	$7	$7	$5	$5	$0	$0	$0	$0
SLO-4-6079012302	$228	$228	$158	$158	$14	$14	$14	$14
SLO-4-6079012702	$5,970,000	$6,210,000	$4,140,000	$4,310,000	$453,000	$468,000	$382,000	$397,000
SNB-1-6053010606	$1	$1	$1	$1	$0	$0	$0	$0
SNB-1-6069000200	$449	$449	$311	$311	$28	$28	$28	$28
SNB-1-6069000800	$5,090,000	$5,760,000	$3,530,000	$4,000,000	$353,000	$395,000	$323,000	$364,000
SNB-2-6069000800	$13,200	$13,700	$9,570	$9,970	$1,080	$1,120	$890	$925
SNB-3-6053011102	$3	$3	$2	$2	$0	$0	$0	$0
SNB-3-6053011201	$27	$27	$19	$19	$2	$2	$2	$2
SNB-3-6069000800	$7,510,000	$7,750,000	$5,210,000	$5,380,000	$546,000	$561,000	$479,000	$493,000
SNM-1-6081603000	$0	$0	$0	$0	$0	$0	$0	$0
SNM-1-6081603100	$169	$169	$130	$130	$2,520	$2,520	$252	$252
SNM-1-6081603200	$236	$236	$164	$164	$9,330	$9,330	$908	$908
SNM-1-6081603300	$1,120,000	$1,160,000	$776,000	$806,000	$92,900	$95,700	$72,300	$75,100
SNM-1-6081603400	$361,000	$375,000	$250,000	$260,000	$28,600	$29,500	$23,200	$24,100
SNM-1-6081603500	$17	$17	$12	$12	$1	$1	$1	$1
SNM-1-6081603600	$80	$80	$56	$56	$5,280	$5,280	$511	$511
SNM-1-6081613501	$211,000	$332,000	$147,000	$231,000	$13,400	$21,000	$13,300	$20,900
SNM-1-6081613502	$4,290,000	$4,490,000	$2,980,000	$3,120,000	$366,000	$379,000	$279,000	$291,000
SNM-1-6081613600	$2,700,000	$2,870,000	$1,870,000	$1,990,000	$223,000	$234,000	$174,000	$185,000
SNM-1-6081613700	$13,200,000	$14,700,000	$9,160,000	$10,200,000	$949,000	$1,040,000	$840,000	$931,000
SNM-2-6081613200	$279,000	$282,000	$194,000	$196,000	$18,500	$18,700	$17,600	$17,800

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
SNM-2-6081613400	$604,000	$628,000	$419,000	$436,000	$47,400	$48,900	$38,800	$40,300
SNM-2-6081613700	$693,000	$709,000	$481,000	$492,000	$50,400	$51,400	$44,100	$45,200
SNM-2-6081613800	$106,000,000	$111,000,000	$73,500,000	$76,900,000	$8,270,000	$8,580,000	$6,800,000	$7,110,000
SNM-2-6085511703	$181,000	$320,000	$126,000	$222,000	$11,400	$20,100	$11,400	$20,100
SNM-2-6087120200	$62,100	$67,000	$43,100	$46,500	$5,870	$6,170	$4,090	$4,390
SNM-2-6087120500	$31	$31	$22	$22	$2	$2	$2	$2
SOL-1-6055201002	$365,000	$507,000	$253,000	$352,000	$30,900	$39,900	$23,700	$32,600
SOL-1-6095250102	$50,600	$62,600	$35,200	$43,500	$89,000	$89,700	$11,400	$12,200
SOL-1-6095252102	$137,000	$156,000	$95,200	$108,000	$20,100	$21,300	$9,700	$10,900
SOL-1-6095252104	$0	$0	$0	$0	$0	$0	$0	$0
SOL-1-6095252202	$1,360,000	$1,700,000	$944,000	$1,180,000	$284,000	$305,000	$104,000	$126,000
SOL-2-6055201002	$7,210,000	$7,600,000	$5,010,000	$5,280,000	$492,000	$517,000	$456,000	$481,000
SOL-2-6095252201	$1,690,000	$2,170,000	$1,180,000	$1,510,000	$320,000	$350,000	$127,000	$157,000
SOL-3-6055201002	$2,420,000	$2,940,000	$1,680,000	$2,040,000	$286,000	$318,000	$165,000	$197,000
SOL-3-6095252201	$1,440,000	$1,840,000	$999,000	$1,270,000	$364,000	$389,000	$117,000	$141,000
SON-1-6097151503	$80	$80	$68	$68	$2,250	$2,250	$221	$221
SON-1-6097151600	$116	$116	$107	$107	$7	$7	$10	$10
SON-2-6097150303	$11,500	$13,300	$7,970	$9,230	$1,440	$1,560	$789	$903
SON-2-6097150500	$1	$1	$1	$1	$80	$80	$8	$8
SON-2-6097150606	$109,000	$130,000	$75,400	$90,300	$15,600	$16,900	$7,660	$9,010
SON-2-6097151309	$126,000	$147,000	$87,500	$102,000	$19,900	$21,200	$9,060	$10,400
SON-3-6041133000	$190	$190	$152	$152	$3,480	$3,480	$346	$346
SON-3-6097150800	$248,000	$295,000	$172,000	$205,000	$69,300	$72,200	$20,700	$23,700
SON-3-6097151100	$14	$14	$12	$12	$440	$440	$43	$43
STB-1-6083001800	$12,200	$12,700	$8,470	$8,780	$944	$972	$783	$811
STB-2-6083002006	$9,490,000	$10,000,000	$6,590,000	$6,940,000	$827,000	$859,000	$618,000	$650,000
STB-2-6083002500	$2,740,000	$2,930,000	$1,900,000	$2,030,000	$227,000	$239,000	$177,000	$189,000
STB-2-6083002603	$23,100	$58,700	$16,600	$41,300	$1,450	$3,680	$1,500	$3,740
STB-3-6083001800	$214,000	$245,000	$149,000	$171,000	$13,700	$15,700	$13,500	$15,400
STB-3-6083001901	$8,950	$9,520	$6,210	$6,610	$787	$823	$583	$619

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
STB-3-6083001905	$206,000	$207,000	$144,000	$144,000	$13,100	$13,100	$13,000	$13,000
STB-4-6083002603	$222	$222	$154	$154	$14	$14	$14	$14
STB-4-6083002805	$1,630	$1,630	$1,130	$1,130	$102	$102	$102	$102
STB-5-6083001906	$67,000	$71,400	$46,500	$49,600	$6,060	$6,340	$4,380	$4,660
STB-5-6083002805	$1,940,000	$1,990,000	$1,340,000	$1,380,000	$121,000	$125,000	$122,000	$125,000
STB-5-6083002910	$67,100	$71,600	$46,600	$49,700	$6,240	$6,520	$4,410	$4,680
STB-6-6083001906	$9,000	$9,580	$6,250	$6,650	$797	$834	$587	$624
STB-6-6083002910	$8,040,000	$8,540,000	$5,580,000	$5,920,000	$650,000	$681,000	$518,000	$550,000
STB-7-6083000103	$17	$17	$12	$12	$1	$1	$1	$1
STB-7-6083000501	$2	$2	$2	$2	$0	$0	$0	$0
STB-7-6083000700	$3	$3	$2	$2	$0	$0	$0	$0
STB-7-6083001500	$15	$15	$10	$10	$1	$1	$1	$1
STB-7-6083001701	$13,100	$13,900	$9,120	$9,660	$1,130	$1,180	$854	$903
STB-7-6083001800	$5,990,000	$6,020,000	$4,160,000	$4,180,000	$389,000	$391,000	$377,000	$379,000
STB-7-6083001906	$1,150,000	$1,160,000	$797,000	$808,000	$78,400	$79,400	$72,600	$73,600
STB-7-6083002907	$3	$3	$2	$2	$0	$0	$0	$0
STB-7-6083002910	$2	$2	$2	$2	$0	$0	$0	$0
STB-7-6111000100	$11,500	$11,500	$7,970	$7,970	$721	$721	$721	$721
STC-1-6085503312	$89	$89	$72	$72	$6	$6	$7	$7
STC-1-6085503319	$14	$14	$10	$10	$1	$1	$1	$1
STC-1-6085504201	$4	$4	$3	$3	$0	$0	$0	$0
STC-1-6085504202	$4,480,000	$4,650,000	$3,110,000	$3,230,000	$354,000	$365,000	$288,000	$299,000
STC-1-6085504308	$134	$134	$93	$93	$363	$363	$42	$42
STC-1-6085512100	$6	$6	$4	$4	$0	$0	$0	$0
STC-1-6085512402	$1	$1	$1	$1	$0	$0	$0	$0
STC-1-6085512700	$19,600,000	$20,400,000	$13,600,000	$14,200,000	$1,460,000	$1,510,000	$1,250,000	$1,300,000
STC-2-6047002100	$51,200	$102,000	$35,500	$70,800	$36,200	$39,400	$6,380	$9,560
STC-2-6069000100	$1,880,000	$2,090,000	$1,300,000	$1,450,000	$185,000	$199,000	$124,000	$138,000
STC-2-6085512402	$8	$8	$6	$6	$26	$26	$3	$3
STC-2-6085512602	$416,000	$434,000	$289,000	$301,000	$32,000	$33,100	$26,700	$27,800

SUBUNIT	PRESENT VALUE IMPACTS				ANNUALIZED IMPACTS			
	3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE		3 PERCENT DISCOUNT RATE		7 PERCENT DISCOUNT RATE	
	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH
STC-2-6085512700	$71,800,000	$75,900,000	$49,900,000	$52,700,000	$5,520,000	$5,770,000	$4,610,000	$4,860,000
STC-2-6099003400	$15,800	$17,400	$10,900	$12,100	$1,750	$1,850	$1,060	$1,160
VEN-1-6111000902	$1,990,000	$2,120,000	$1,380,000	$1,470,000	$136,000	$144,000	$126,000	$134,000
VEN-1-6111001001	$464	$464	$328	$328	$58	$58	$32	$32
VEN-1-6111001101	$13	$13	$9	$9	$6	$6	$1	$1
VEN-1-6111001102	$48	$399	$34	$278	$3	$25	$3	$25
VEN-1-6111001204	$70	$15,700	$48	$10,900	$4	$987	$4	$987
VEN-2-6037920104	$2,720	$2,720	$1,880	$1,880	$170	$170	$170	$170
VEN-2-6111000100	$5,050	$5,050	$3,500	$3,500	$317	$317	$317	$317
VEN-3-6037800201	$0	$0	$0	$0	$0	$0	$0	$0
VEN-3-6037800302	$0	$0	$0	$0	$0	$0	$0	$0
VEN-3-6111007404	$7,570,000	$8,270,000	$5,250,000	$5,740,000	$577,000	$621,000	$485,000	$528,000
VEN-3-6111007503	$424,000	$429,000	$294,000	$298,000	$28,500	$28,800	$26,800	$27,100
VEN-3-6111007506	$21	$21	$15	$15	$1	$1	$1	$1
YUB-1-6115041100	$1,110,000	$1,220,000	$773,000	$845,000	$123,000	$129,000	$75,000	$81,500
Total	**$1,040,000,000**	**$1,100,000,000**	**$721,000,000**	**$767,000,000**	**$93,700,000**	**$97,900,000**	**$67,900,000**	**$72,000,000**

APPENDIX C | THREE PERCENT DISCOUNT RATE EXHIBITS

Appendix C provides detailed tables for impacts discussed in the Chapters. Present values and annualized costs are estimated based on a discount rate of three percent.

EXHIBIT C-1 PRESENT VALUE POST-DESIGNATION BASELINE IMPACTS BY PROPOSED CRITICAL HABITAT UNIT AND ACTIVITY (2008 DOLLARS, HIGH-END SCENARIO, THREE PERCENT DISCOUNT RATE)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$91,800,000	$21,700	$0	$0	$0	$0	$0	$29	$91,800,000
ALA-1B	$65,100,000	$84,000	$0	$0	$0	$0	$0	$79	$65,200,000
ALA-2	$186,000,000	$185,000	$3,270,000	$0	$0	$0	$219,000	$2,200	$190,000,000
BUT-1	$0	$58,700	$0	$68,400	$0	$17,200	$0	$67,500	$212,000
CAL-1	$12,100,000	$39,100	$0	$0	$0	$0	$0	$0	$12,200,000
CCS-1	$495,000	$108,000	$1,530,000	$0	$0	$0	$109,000	$140	$2,240,000
CCS-2	$665,000,000	$329,000	$182,000,000	$0	$594,000	$0	$328,000	$1,330	$848,000,000
ELD-1	$12,200,000	$58,700	$404,000	$5,980	$0	$0	$0	$120,000	$12,700,000
LOS-1	$0	$39,100	$0	$0	$0	$13,000	$0	$8,580	$60,600
MEN-1	$92,200	$78,200	$0	$0	$0	$0	$0	$0	$170,000
MNT-1	$45,900	$39,400	$78,800	$0	$0	$0	$0	$71	$164,000
MNT-2	$32,500,000	$195,000	$17,100,000	$0	$886,000	$0	$109,000	$16,900	$50,800,000
MNT-3	$41,200	$96,100	$7,670,000	$0	$0	$0	$0	$3,970	$7,810,000
MRN-1	$2,520,000	$19,600	$29,600,000	$0	$0	$0	$0	$1,780	$32,100,000
MRN-2	$242,000	$39,100	$4,590,000	$0	$0	$0	$0	$5,130	$4,870,000
MRN-3	$1,760,000	$78,200	$1,380,000	$0	$0	$0	$0	$7,720	$3,230,000
NAP-1	$640,000	$19,600	$4,170,000	$0	$0	$0	$0	$0	$4,830,000
NEV-1	$5,720,000	$78,200	$3,200,000	$16,500	$0	$1,030	$0	$82,600	$9,090,000
PLA-1	$757,000	$69,100	$0	$5,820	$0	$0	$0	$37,000	$869,000
RIV-1	$2,270,000	$58,700	$5,100,000	$0	$0	$0	$0	$0	$7,430,000
SCZ-1	$174,000,000	$159,000	$116,000,000	$0	$162,000	$0	$109,000	$94,000	$291,000,000
SCZ-2	$124,000,000	$62,200	$91,700,000	$0	$162,000	$0	$0	$5,500	$216,000,000
SLO-1	$13,000,000	$45,000	$2,960,000	$0	$0	$0	$219,000	$16,500	$16,200,000
SLO-2	$72,700,000	$105,000	$24,200,000	$0	$0	$0	$109,000	$13,300	$97,100,000
SLO-3	$139,000,000	$166,000	$17,900,000	$0	$301,000	$0	$219,000	$14,400	$158,000,000
SLO-4	$0	$72,300	$10,500	$0	$0	$0	$0	$4,330	$87,100
SNB-1	$1,330,000	$65,700	$8,200,000	$0	$0	$0	$0	$1,400	$9,600,000
SNB-2	$4,010	$22,900	$219,000	$0	$0	$0	$109,000	$668	$356,000
SNB-3	$114,000	$71,100	$76,900	$0	$0	$0	$109,000	$2,470	$374,000
SNM-1	$33,100,000	$149,000	$7,460,000	$0	$0	$0	$109,000	$324	$40,900,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SNM-2	$78,200,000	$191,000	$51,100,000	$0	$0	$0	$0	$2,040	$130,000,000
SOL-1	$9,340,000	$19,600	$26,200	$0	$0	$0	$109,000	$0	$9,500,000
SOL-2	$1,600,000	$19,600	$11,400	$0	$0	$0	$109,000	$0	$1,740,000
SOL-3	$9,750,000	$39,100	$9,550,000	$0	$0	$0	$109,000	$0	$19,400,000
SON-1	$195,000	$39,100	$138,000	$0	$0	$0	$0	$0	$372,000
SON-2	$294,000	$19,600	$7,040	$0	$0	$0	$0	$0	$320,000
SON-3	$3,360,000	$39,100	$4,220,000	$0	$0	$0	$0	$176	$7,610,000
STB-1	$0	$49,600	$0	$0	$0	$0	$0	$5,990	$55,600
STB-2	$13,000,000	$54,100	$8,360,000	$0	$0	$0	$109,000	$8,030	$21,500,000
STB-3	$0	$78,400	$14,500	$0	$0	$0	$0	$11,300	$104,000
STB-4	$0	$42,700	$0	$0	$0	$0	$0	$1,940	$44,700
STB-5	$65,800	$64,000	$2,920	$0	$284,000	$0	$219,000	$2,900	$639,000
STB-6	$9,800,000	$63,600	$9,580,000	$0	$0	$0	$219,000	$2,710	$19,700,000
STB-7	$18,900	$159,000	$36,000	$0	$0	$0	$109,000	$40,100	$363,000
STC-1	$12,200,000	$88,100	$19,500,000	$0	$0	$0	$109,000	$295	$31,900,000
STC-2	$50,200,000	$147,000	$13,200,000	$0	$0	$0	$109,000	$3,450	$63,700,000
VEN-1	$917,000	$25,400	$17,400,000	$0	$0	$0	$109,000	$1,910	$18,400,000
VEN-2	$0	$49,700	$0	$0	$0	$1,850	$0	$10,800	$62,400
VEN-3	$0	$88,300	$4,850,000	$0	$0	$0	$219,000	$3,280	$5,160,000
YUB-1	$1,480,000	$39,100	$0	$8,970	$0	$0	$0	$52,100	$1,580,000
Total	**$1,830,000,000**	**$3,930,000**	**$667,000,000**	**$106,000**	**$2,390,000**	**$33,100**	**$3,280,000**	**$654,000**	**$2,500,000,000**

EXHIBIT C-2 PRESENT VALUE POST-DESIGNATION INCREMENTAL IMPACTS BY PROPOSED CRITICAL HABITAT UNIT AND ACTIVITY (2008 DOLLARS, HIGH-END SCENARIO, THREE PERCENT DISCOUNT RATE)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$6,660,000	$705	$0	$8,400	$0	$0	$0	$0	$10	$6,670,000
ALA-1B	$77,500,000	$1,930	$0	$23,400	$0	$0	$0	$0	$26	$77,500,000
ALA-2	$134,000,000	$22,600	$341,000	$353,000	$0	$0	$0	$5,510	$735	$135,000,000
BUT-1	$0	$0	$0	$0	$3,700	$0	$0	$0	$0	$3,700
CAL-1	$12,400,000	$0	$0	$0	$0	$0	$0	$0	$0	$12,400,000
CCS-1	$5,290,000	$3,300	$808,000	$0	$0	$0	$0	$2,750	$47	$6,110,000
CCS-2	$85,500,000	$31,600	$12,000,000	$0	$0	$7,270	$0	$8,260	$444	$97,600,000
ELD-1	$16,100,000	$0	$1,730,000	$0	$1,980	$0	$0	$0	$0	$17,800,000
LOS-1	$0	$0	$0	$0	$0	$0	$4,320	$0	$2,860	$7,180
MEN-1	$14,500,000	$0	$0	$0	$0	$0	$0	$0	$0	$14,500,000
MNT-1	$0	$113	$0	$0	$0	$0	$0	$0	$24	$137
MNT-2	$39,100,000	$26,000	$6,610,000	$0	$0	$10,900	$0	$2,750	$5,640	$45,800,000
MNT-3	$111,000	$5,980	$2,900	$0	$0	$0	$0	$0	$1,320	$121,000
MRN-1	$937,000	$0	$9,430,000	$0	$0	$0	$0	$0	$593	$10,400,000
MRN-2	$3,380,000	$0	$52,000,000	$0	$0	$0	$0	$0	$1,710	$55,400,000
MRN-3	$1,640,000	$0	$1,320,000	$0	$0	$0	$0	$0	$2,580	$2,950,000
NAP-1	$90,600	$0	$165,000	$0	$0	$0	$0	$0	$0	$256,000
NEV-1	$8,660,000	$0	$2,910,000	$0	$4,340	$0	$35,400	$0	$0	$11,600,000
PLA-1	$160	$3,470	$0	$0	$1,940	$0	$15,900	$0	$0	$21,400
RIV-1	$142,000	$0	$434	$0	$0	$0	$0	$0	$0	$143,000
SCZ-1	$25,700,000	$20,600	$21,900,000	$0	$0	$1,980	$0	$2,750	$31,400	$47,600,000
SCZ-2	$1,870,000	$1,180	$3,370,000	$0	$0	$1,980	$0	$0	$1,830	$5,250,000
SLO-1	$10,200,000	$1,970	$2,320,000	$0	$0	$0	$0	$5,510	$5,500	$12,500,000
SLO-2	$53,400,000	$15,500	$18,200,000	$0	$0	$0	$0	$2,750	$4,430	$71,600,000
SLO-3	$134,000,000	$16,200	$18,100,000	$0	$0	$3,690	$0	$5,510	$4,790	$152,000,000
SLO-4	$4,700,000	$4,550	$1,500,000	$0	$0	$0	$0	$0	$1,440	$6,210,000
SNB-1	$835,000	$2,350	$4,920,000	$0	$0	$0	$0	$0	$466	$5,760,000
SNB-2	$7,800	$1,120	$1,840	$0	$0	$0	$0	$2,750	$223	$13,700
SNB-3	$2,560,000	$4,150	$5,180,000	$0	$0	$0	$0	$2,750	$823	$7,750,000
SNM-1	$18,600,000	$4,100	$5,240,000	$0	$0	$0	$0	$2,750	$108	$23,900,000
SNM-2	$90,700,000	$11,400	$22,100,000	$0	$0	$0	$0	$0	$679	$113,000,000
SOL-1	$2,010,000	$0	$412,000	$0	$0	$0	$0	$2,750	$0	$2,420,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SOL-2	$2,720,000	$0	$7,050,000	$0	$0	$0	$0	$2,750	$0	$9,770,000
SOL-3	$3,060,000	$0	$1,710,000	$0	$0	$0	$0	$2,750	$0	$4,780,000
SON-1	$31	$0	$166	$0	$0	$0	$0	$0	$0	$196
SON-2	$291,000	$0	$173	$0	$0	$0	$0	$0	$0	$291,000
SON-3	$229,000	$0	$66,500	$0	$0	$0	$0	$0	$59	$296,000
STB-1	$7,170	$3,490	$0	$0	$0	$0	$0	$0	$2,000	$12,700
STB-2	$9,910,000	$5,000	$3,070,000	$0	$0	$0	$0	$2,750	$2,680	$13,000,000
STB-3	$29,000	$6,600	$422,000	$0	$0	$0	$0	$0	$3,780	$461,000
STB-4	$0	$1,210	$0	$0	$0	$0	$0	$0	$647	$1,850
STB-5	$141,000	$1,790	$1,980,000	$0	$0	$3,480	$0	$5,510	$968	$2,130,000
STB-6	$3,580,000	$1,660	$4,960,000	$0	$0	$0	$0	$5,510	$903	$8,550,000
STB-7	$808,000	$26,900	$6,360,000	$0	$0	$0	$0	$2,750	$13,400	$7,210,000
STC-1	$18,000,000	$3,300	$7,100,000	$0	$0	$0	$0	$2,750	$98	$25,100,000
STC-2	$62,500,000	$9,820	$16,000,000	$0	$0	$0	$0	$2,750	$1,150	$78,500,000
VEN-1	$253,000	$1,970	$1,880,000	$0	$0	$0	$0	$2,750	$639	$2,140,000
VEN-2	$0	$3,550	$0	$0	$0	$0	$616	$0	$3,600	$7,760
VEN-3	$6,200,000	$3,370	$2,490,000	$0	$0	$0	$0	$5,510	$1,100	$8,690,000
YUB-1	$1,220,000	$0	$0	$0	$2,860	$0	$0	$0	$0	$1,220,000
Total	**$860,000,000**	**$247,000**	**$244,000,000**	**$385,000**	**$14,800**	**$29,300**	**$56,300**	**$82,600**	**$98,600**	**$1,100,000,000**

EXHIBIT C-3 PRESENT VALUE POST-DESIGNATION IMPACTS BY ACTIVITY AND DISTRIBUTION OF IMPACTS BY ACTIVITY (2008 DOLLARS, HIGH-END SCENARIO, THREE PERCENT DISCOUNT RATE)

ACTIVITY	BASELINE IMPACTS		INCREMENTAL IMPACTS	
	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS	PRESENT VALUE IMPACTS	PERCENT OF TOTAL IMPACTS
Development	$1,830,000,000	73%	$860,000,000	78%
Water Management	$3,930,000	0%	$247,000	0%
Agriculture	$667,000,000	27%	$244,000,000	22%
Grazing	$0	0%	$385,000	0%
Timber Harvest	$106,000	0%	$14,800	0%
Transportation	$2,390,000	0%	$29,300	0%
Fire Management	$33,100	0%	$56,300	0%
Utility & Pipeline	$3,280,000	0%	$82,600	0%
Species Management	$654,000	0%	$98,600	0%
Total	**$2,500,000,000**	**100%**	**$1,100,000,000**	**100%**

EXHIBIT C-4 ANNUALIZED POST-DESIGNATION BASELINE IMPACTS BY PROPOSED CRITICAL HABITAT UNIT AND ACTIVITY (2008 DOLLARS, HIGH-END SCENARIO, THREE PERCENT DISCOUNT RATE)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$6,600,000	$1,360	$0	$0	$0	$0	$0	$2	$6,600,000
ALA-1B	$4,630,000	$5,270	$0	$0	$0	$0	$0	$5	$4,640,000
ALA-2	$14,200,000	$11,600	$205,000	$0	$0	$0	$13,700	$138	$14,400,000
BUT-1	$0	$3,680	$0	$4,290	$0	$1,080	$0	$4,230	$13,300
CAL-1	$1,590,000	$2,450	$0	$0	$0	$0	$0	$0	$1,590,000
CCS-1	$40,500	$6,760	$96,000	$0	$0	$0	$6,870	$9	$150,000
CCS-2	$54,500,000	$20,700	$11,400,000	$0	$37,300	$0	$20,600	$84	$66,000,000
ELD-1	$1,190,000	$3,680	$25,400	$375	$0	$0	$0	$7,500	$1,230,000
LOS-1	$0	$2,450	$0	$0	$0	$813	$0	$538	$3,810
MEN-1	$7,950	$4,910	$0	$0	$0	$0	$0	$0	$12,900
MNT-1	$2,880	$2,480	$4,940	$0	$0	$0	$0	$4	$10,300
MNT-2	$2,060,000	$12,200	$1,080,000	$0	$55,600	$0	$6,870	$1,060	$3,210,000
MNT-3	$2,580	$6,030	$481,000	$0	$0	$0	$0	$249	$490,000
MRN-1	$196,000	$1,230	$1,860,000	$0	$0	$0	$0	$111	$2,060,000
MRN-2	$18,900	$2,450	$288,000	$0	$0	$0	$0	$322	$310,000
MRN-3	$139,000	$4,910	$86,900	$0	$0	$0	$0	$485	$231,000
NAP-1	$49,400	$1,230	$262,000	$0	$0	$0	$0	$0	$312,000
NEV-1	$533,000	$4,910	$201,000	$1,040	$0	$65	$0	$5,180	$745,000
PLA-1	$82,800	$4,330	$0	$365	$0	$0	$0	$2,320	$89,800
RIV-1	$272,000	$3,680	$320,000	$0	$0	$0	$0	$0	$596,000
SCZ-1	$14,400,000	$10,000	$7,300,000	$0	$10,200	$0	$6,870	$5,900	$21,700,000
SCZ-2	$10,300,000	$3,900	$5,750,000	$0	$10,200	$0	$0	$345	$16,000,000
SLO-1	$1,180,000	$2,820	$186,000	$0	$0	$0	$13,700	$1,040	$1,380,000
SLO-2	$5,420,000	$6,590	$1,520,000	$0	$0	$0	$6,870	$834	$6,960,000
SLO-3	$10,400,000	$10,400	$1,120,000	$0	$18,900	$0	$13,700	$901	$11,600,000
SLO-4	$0	$4,540	$659	$0	$0	$0	$0	$271	$5,470
SNB-1	$111,000	$4,120	$514,000	$0	$0	$0	$0	$88	$629,000
SNB-2	$333	$1,440	$13,700	$0	$0	$0	$6,870	$42	$22,400
SNB-3	$9,490	$4,460	$4,830	$0	$0	$0	$6,870	$155	$25,800
SNM-1	$2,380,000	$9,360	$468,000	$0	$0	$0	$6,870	$20	$2,870,000
SNM-2	$5,760,000	$12,000	$3,210,000	$0	$0	$0	$0	$128	$8,980,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SOL-1	$1,040,000	$1,230	$1,650	$0	$0	$0	$6,870	$0	$1,050,000
SOL-2	$185,000	$1,230	$714	$0	$0	$0	$6,870	$0	$194,000
SOL-3	$1,100,000	$2,450	$599,000	$0	$0	$0	$6,870	$0	$1,710,000
SON-1	$19,000	$2,450	$8,670	$0	$0	$0	$0	$0	$30,100
SON-2	$29,700	$1,230	$442	$0	$0	$0	$0	$0	$31,300
SON-3	$337,000	$2,450	$264,000	$0	$0	$0	$0	$11	$604,000
STB-1	$0	$3,110	$0	$0	$0	$0	$0	$376	$3,490
STB-2	$1,020,000	$3,390	$525,000	$0	$0	$0	$6,870	$504	$1,550,000
STB-3	$0	$4,920	$909	$0	$0	$0	$0	$711	$6,540
STB-4	$0	$2,680	$0	$0	$0	$0	$0	$122	$2,800
STB-5	$5,280	$4,020	$183	$0	$17,800	$0	$13,700	$182	$41,200
STB-6	$786,000	$3,990	$601,000	$0	$0	$0	$13,700	$170	$1,410,000
STB-7	$1,520	$9,960	$2,260	$0	$0	$0	$6,870	$2,510	$23,100
STC-1	$889,000	$5,530	$1,220,000	$0	$0	$0	$6,870	$19	$2,130,000
STC-2	$3,710,000	$9,210	$829,000	$0	$0	$0	$6,870	$217	$4,560,000
VEN-1	$72,500	$1,600	$1,090,000	$0	$0	$0	$6,870	$120	$1,170,000
VEN-2	$0	$3,120	$0	$0	$0	$116	$0	$677	$3,910
VEN-3	$0	$5,540	$304,000	$0	$0	$0	$13,700	$206	$324,000
YUB-1	$128,000	$2,450	$0	$563	$0	$0	$0	$3,270	$134,000
Total	**$145,000,000**	**$247,000**	**$41,900,000**	**$6,630**	**$150,000**	**$2,070**	**$206,000**	**$41,100**	**$188,000,000**

EXHIBIT C-5 ANNUALIZED POST-DESIGNATION INCREMENTAL IMPACTS BY PROPOSED CRITICAL HABITAT UNIT AND ACTIVITY (2008 DOLLARS, HIGH-END SCENARIO, THREE PERCENT DISCOUNT RATE)

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
ALA-1A	$812,000	$44	$0	$527	$0	$0	$0	$0	$1	$812,000
ALA-1B	$6,140,000	$121	$0	$1,470	$0	$0	$0	$0	$2	$6,140,000
ALA-2	$11,600,000	$1,420	$21,400	$22,200	$0	$0	$0	$345	$46	$11,700,000
BUT-1	$0	$0	$0	$0	$232	$0	$0	$0	$0	$232
CAL-1	$2,520,000	$0	$0	$0	$0	$0	$0	$0	$0	$2,520,000
CCS-1	$432,000	$207	$50,700	$0	$0	$0	$0	$173	$3	$484,000
CCS-2	$12,500,000	$1,980	$752,000	$0	$0	$456	$0	$518	$28	$13,200,000
ELD-1	$2,010,000	$0	$108,000	$0	$125	$0	$0	$0	$0	$2,120,000
LOS-1	$0	$0	$0	$0	$0	$0	$271	$0	$179	$451
MEN-1	$1,400,000	$0	$0	$0	$0	$0	$0	$0	$0	$1,400,000
MNT-1	$0	$7	$0	$0	$0	$0	$0	$0	$1	$9
MNT-2	$2,470,000	$1,630	$415,000	$0	$0	$681	$0	$173	$354	$2,880,000
MNT-3	$6,950	$375	$182	$0	$0	$0	$0	$0	$83	$7,590
MRN-1	$91,400	$0	$592,000	$0	$0	$0	$0	$0	$37	$683,000
MRN-2	$286,000	$0	$3,260,000	$0	$0	$0	$0	$0	$107	$3,550,000
MRN-3	$150,000	$0	$82,600	$0	$0	$0	$0	$0	$162	$233,000
NAP-1	$10,700	$0	$10,300	$0	$0	$0	$0	$0	$0	$21,000
NEV-1	$994,000	$0	$183,000	$0	$272	$0	$2,220	$0	$0	$1,180,000
PLA-1	$11,800	$218	$0	$0	$122	$0	$996	$0	$0	$13,100
RIV-1	$65,500	$0	$27	$0	$0	$0	$0	$0	$0	$65,500
SCZ-1	$3,500,000	$1,290	$1,370,000	$0	$0	$124	$0	$173	$1,970	$4,880,000
SCZ-2	$1,010,000	$74	$211,000	$0	$0	$124	$0	$0	$115	$1,220,000
SLO-1	$1,200,000	$124	$145,000	$0	$0	$0	$0	$345	$345	$1,350,000
SLO-2	$4,530,000	$972	$1,140,000	$0	$0	$0	$0	$173	$278	$5,670,000
SLO-3	$11,200,000	$1,010	$1,130,000	$0	$0	$231	$0	$345	$300	$12,400,000
SLO-4	$374,000	$285	$94,300	$0	$0	$0	$0	$0	$91	$468,000
SNB-1	$85,700	$148	$309,000	$0	$0	$0	$0	$0	$29	$395,000
SNB-2	$744	$71	$115	$0	$0	$0	$0	$173	$14	$1,120
SNB-3	$235,000	$260	$325,000	$0	$0	$0	$0	$173	$52	$561,000
SNM-1	$1,490,000	$258	$329,000	$0	$0	$0	$0	$173	$7	$1,820,000
SNM-2	$7,340,000	$717	$1,380,000	$0	$0	$0	$0	$0	$43	$8,730,000
SOL-1	$430,000	$0	$25,900	$0	$0	$0	$0	$173	$0	$456,000

UNIT	DEVELOPMENT	WATER MANAGEMENT	AGRICULTURE	GRAZING	TIMBER HARVEST	TRANSPORTATION	FIRE MANAGEMENT	UTILITY & PIPELINE	SPECIES MANAGEMENT	TOTAL
SOL-2	$424,000	$0	$442,000	$0	$0	$0	$0	$173	$0	$867,000
SOL-3	$600,000	$0	$108,000	$0	$0	$0	$0	$173	$0	$707,000
SON-1	$2,240	$0	$10	$0	$0	$0	$0	$0	$0	$2,250
SON-2	$39,800	$0	$11	$0	$0	$0	$0	$0	$0	$39,800
SON-3	$72,000	$0	$4,170	$0	$0	$0	$0	$0	$4	$76,100
STB-1	$627	$219	$0	$0	$0	$0	$0	$0	$125	$972
STB-2	$909,000	$314	$193,000	$0	$0	$0	$0	$173	$168	$1,100,000
STB-3	$2,530	$414	$26,500	$0	$0	$0	$0	$0	$237	$29,600
STB-4	$0	$76	$0	$0	$0	$0	$0	$0	$41	$116
STB-5	$12,800	$112	$124,000	$0	$0	$218	$0	$345	$61	$138,000
STB-6	$370,000	$104	$311,000	$0	$0	$0	$0	$345	$57	$682,000
STB-7	$70,900	$1,690	$399,000	$0	$0	$0	$0	$173	$838	$473,000
STC-1	$1,430,000	$207	$445,000	$0	$0	$0	$0	$173	$6	$1,870,000
STC-2	$5,040,000	$616	$1,000,000	$0	$0	$0	$0	$173	$72	$6,050,000
VEN-1	$26,700	$123	$118,000	$0	$0	$0	$0	$173	$40	$145,000
VEN-2	$0	$223	$0	$0	$0	$0	$39	$0	$226	$487
VEN-3	$493,000	$212	$156,000	$0	$0	$0	$0	$345	$69	$650,000
YUB-1	$129,000	$0	$0	$0	$179	$0	$0	$0	$0	$129,000
Total	**$82,500,000**	**$15,500**	**$15,300,000**	**$24,200**	**$930**	**$1,840**	**$3,530**	**$5,180**	**$6,190**	**$97,900,000**

APPENDIX D | UNDISCOUNTED IMPACTS TO ACTIVITIES BY UNIT

This appendix provides details of the undiscounted impacts by year for each activity. These details are provided in accordance with OMB guidelines for developing benefit and cost estimates. OMB directs the analysis to: "include separate schedules of the monetized benefits and costs that show the type and timing of benefits and costs, and express the estimates in this table in constant, undiscounted dollars."[1] For this analysis, this applies to the cost estimates for future years. Circular A-4 directs that future estimates of value should be presented in undiscounted terms. This is an important way to clarify future costs. For example, if a program will cost $10,000 ten years in the future, that future cost estimate should be noted as such to clarify what the cost estimate is in that year.

[1] Office of Management and Budget, Circular A-4, September 17, 2003, p. 18). The reference to "constant" dollars indicates that the effects of general price level inflation (the tendency of all prices to increase over time) should be removed through the use of an inflation adjustment index.

EXHIBIT D-1 UNDISCOUNTED POST-DESIGNATION BASELINE IMPACTS TO RESIDENTIAL AND COMMERCIAL DEVELOPMENT

UNIT	PROJECT MODIFICATIONS *		CEQA COSTS**		ADMINISTRATIVE COSTS ***	FREQUENCY****	DESCRIPTION/SOURCE
	LOW	HIGH	LOW	HIGH			
ALA-1A	$1,470,000	$1,580,000	$4,090,000	$4,180,000	$719	2009-2030	* **Project Modifications**:
ALA-1B	$1,030,000	$1,100,000	$2,920,000	$2,980,000	$466		Low End: Habitat Restoration + Delay Costs ($50,000/ acre)
ALA-2	$3,100,000	$3,440,000	$7,960,000	$8,220,000	$2,150		High End: Mitigation + Delay Costs ($50,000/ acre)
BUT-1	$0	$0	$0	$0	$0		Personal communication with Westervelt mitigation bank staff, Bay Area and Placer County, December 8, 2008; Industrial Economics, Inc., "Addendum to the Economic Analysis of Critical Habitat Designation for the San Bernardino Kangaroo Rat," March 2002, pp 11-13.
CAL-1	$311,000	$420,000	$254,000	$340,000	$705		
CCS-1	$8,720	$9,970	$20,100	$21,100	$8		
CCS-2	$11,700,000	$13,400,000	$26,900,000	$28,300,000	$11,000		
ELD-1	$247,000	$304,000	$413,000	$458,000	$369		
LOS-1	$0	$0	$0	$0	$0		**CEQA Costs**:
MEN-1	$1,690	$1,980	$3,580	$3,800	$2		Low End: CEQA administrative and delay costs for areas with and without a Federal nexus.
MNT-1	$938	$1,160	$1,550	$1,720	$0		
MNT-2	$528,000	$574,000	$1,430,000	$1,460,000	$19		High End: CEQA administrative, delay, and mitigation costs for areas without a Federal nexus; and, CEQA administrative and delay costs for areas with a Federal nexus.
MNT-3	$733	$844	$1,650	$1,740	$0		
MRN-1	$42,700	$47,800	$106,000	$110,000	$33		Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the La Graciosa Thistle," prepared for the U.S. Fish and Wildlife Service, November 2008.
MRN-2	$4,110	$4,600	$10,200	$10,600	$3		
MRN-3	$30,100	$33,900	$73,200	$76,200	$25		
NAP-1	$10,800	$12,000	$27,200	$28,200	$8		*** **Administrative Costs of section 7 consultations**: Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation.
NEV-1	$111,000	$135,000	$206,000	$224,000	$149		
PLA-1	$16,800	$21,400	$22,400	$26,100	$30		
RIV-1	$54,200	$71,400	$57,500	$71,100	$111		
SCZ-1	$3,080,000	$3,540,000	$7,000,000	$7,360,000	$2,950		**** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
SCZ-2	$2,200,000	$2,540,000	$4,960,000	$5,220,000	$2,150		
SLO-1	$248,000	$297,000	$477,000	$516,000	$315		
SLO-2	$1,190,000	$1,310,000	$3,160,000	$3,250,000	$741		
SLO-3	$2,290,000	$2,510,000	$6,060,000	$6,240,000	$1,420		
SLO-4	$0	$0	$0	$0	$0		
SNB-1	$23,700	$27,300	$53,400	$56,200	$23		

UNIT	PROJECT MODIFICATIONS *		CEQA COSTS**		ADMINISTRATIVE COSTS ***	FREQUENCY****	DESCRIPTION/SOURCE
	LOW	HIGH	LOW	HIGH			
SNB-2	$71	$82	$161	$169	$0		
SNB-3	$2,040	$2,340	$4,580	$4,820	$2		
SNM-1	$530,000	$570,000	$1,480,000	$1,510,000	$261		
SNM-2	$1,270,000	$1,380,000	$3,430,000	$3,520,000	$729		
SOL-1	$210,000	$270,000	$269,000	$316,000	$387		
SOL-2	$37,100	$48,300	$43,100	$52,000	$73		
SOL-3	$222,000	$287,000	$273,000	$325,000	$420		
SON-1	$3,930	$4,820	$6,700	$7,410	$6		
SON-2	$6,100	$7,590	$9,670	$10,800	$10		
SON-3	$69,300	$86,000	$111,000	$124,000	$108		
STB-1	$0	$0	$0	$0	$0		
STB-2	$222,000	$249,000	$546,000	$567,000	$174		
STB-3	$0	$0	$0	$0	$0		
STB-4	$0	$0	$0	$0	$0		
STB-5	$1,140	$1,290	$2,710	$2,830	$1		
STB-6	$170,000	$193,000	$404,000	$422,000	$147		
STB-7	$328	$372	$780	$814	$0		
STC-1	$197,000	$213,000	$537,000	$550,000	$107		
STC-2	$819,000	$894,000	$2,200,000	$2,260,000	$481		
VEN-1	$15,700	$17,700	$38,200	$39,800	$13		
VEN-2	$0	$0	$0	$0	$0		
VEN-3	$0	$0	$0	$0	$0		
YUB-1	$27,200	$31,800	$57,500	$61,100	$30		

EXHIBIT D-2 UNDISCOUNTED POST-DESIGNATION INCREMENTAL IMPACTS TO RESIDENTIAL AND COMMERCIAL DEVELOPMENT

UNIT	PROJECT MODIFICATIONS *		CEQA COSTS**		ADMINISTRATIVE COSTS ***	FREQUENCY****	DESCRIPTION/SOURCE
	LOW	HIGH	LOW	HIGH			
ALA-1A	$98,700	$115,000	$301,000	$303,000	$337	2009-2030	* **Project Modifications**:
ALA-1B	$1,140,000	$1,300,000	$3,540,000	$3,560,000	$1,100		Low End: Habitat Restoration + Delay Costs ($50,000/ acre)
ALA-2	$1,990,000	$2,320,000	$6,060,000	$6,100,000	$2,720		High End: Mitigation + Delay Costs ($50,000/ acre)
BUT-1	$0	$0	$0	$0	$0		Personal communication with Westervelt mitigation bank staff, Bay Area and Placer County, December 8, 2008; Industrial Economics, Inc., "Addendum to the Economic Analysis of Critical Habitat Designation for the San Bernardino Kangaroo Rat," March 2002, pp 11-13.
CAL-1	$210,000	$413,000	$337,000	$365,000	$1,490		
CCS-1	$78,600	$92,200	$238,000	$240,000	$86		
CCS-2	$1,300,000	$1,690,000	$3,620,000	$3,670,000	$6,080		
ELD-1	$250,000	$370,000	$620,000	$636,000	$861		
LOS-1	$0	$0	$0	$0	$0		**CEQA Costs**:
MEN-1	$220,000	$288,000	$610,000	$619,000	$423		Low End: CEQA administrative and delay costs for areas with and without a Federal nexus.
MNT-1	$0	$0	$0	$0	$0		
MNT-2	$579,000	$665,000	$1,780,000	$1,790,000	$10		High End: CEQA administrative, delay, and mitigation costs for areas without a Federal nexus; and, CEQA administrative and delay costs for areas with a Federal nexus.
MNT-3	$1,670	$2,120	$4,770	$4,830	$0		
MRN-1	$14,000	$16,700	$41,600	$42,000	$28		Industrial Economics, Incorporated, "Draft Economic Analysis of Proposed Critical Habitat Designation for the La Graciosa Thistle," prepared for the U.S. Fish and Wildlife Service, November 2008.
MRN-2	$50,500	$60,500	$150,000	$152,000	$63		
MRN-3	$24,500	$29,700	$72,200	$72,900	$40		
NAP-1	$1,350	$1,620	$4,020	$4,060	$4		*** **Administrative Costs of section 7 consultations**: Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation.
NEV-1	$134,000	$188,000	$348,000	$355,000	$386		
PLA-1	$0	$0	$0	$0	$10		
RIV-1	$2,330	$4,190	$4,450	$4,700	$48		
SCZ-1	$387,000	$490,000	$1,110,000	$1,120,000	$1,620		**** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
SCZ-2	$28,000	$35,500	$80,000	$81,000	$762		
SLO-1	$157,000	$218,000	$413,000	$422,000	$480		
SLO-2	$791,000	$916,000	$2,420,000	$2,430,000	$1,010		
SLO-3	$1,990,000	$2,300,000	$6,080,000	$6,120,000	$2,390		
SLO-4	$69,700	$80,700	$213,000	$214,000	$67		
SNB-1	$12,600	$16,000	$35,900	$36,400	$29		
SNB-2	$118	$149	$336	$340	$0		

UNIT	PROJECT MODIFICATIONS *		CEQA COSTS**		ADMINISTRATIVE COSTS ***	FREQUENCY****	DESCRIPTION/SOURCE
	LOW	HIGH	LOW	HIGH			
SNB-3	$38,500	$48,900	$110,000	$111,000	$64		
SNM-1	$274,000	$304,000	$861,000	$865,000	$271		
SNM-2	$1,340,000	$1,530,000	$4,130,000	$4,160,000	$1,410		
SOL-1	$32,200	$53,500	$69,400	$72,200	$260		
SOL-2	$44,000	$75,400	$90,800	$95,000	$217		
SOL-3	$49,300	$83,300	$104,000	$108,000	$349		
SON-1	$0	$0	$0	$0	$2		
SON-2	$4,570	$7,050	$10,800	$11,200	$18		
SON-3	$3,630	$5,800	$8,240	$8,530	$49		
STB-1	$107	$132	$314	$317	$0		
STB-2	$148,000	$178,000	$439,000	$443,000	$246		
STB-3	$434	$534	$1,270	$1,280	$1		
STB-4	$0	$0	$0	$0	$0		
STB-5	$2,120	$2,610	$6,190	$6,260	$3		
STB-6	$53,600	$66,000	$157,000	$158,000	$125		
STB-7	$12,100	$14,900	$35,400	$35,800	$17		
STC-1	$266,000	$302,000	$821,000	$826,000	$257		
STC-2	$924,000	$1,050,000	$2,850,000	$2,870,000	$958		
VEN-1	$3,780	$4,600	$11,200	$11,300	$9		
VEN-2	$0	$0	$0	$0	$0		
VEN-3	$91,900	$106,000	$280,000	$282,000	$89		
YUB-1	$18,400	$24,200	$51,200	$52,000	$45		

EXHIBIT D-3 UNDISCOUNTED POST-DESIGNATION BASELINE IMPACTS TO WATER DEVELOPMENT

UNIT	ERECTING SILT FENCING*	ADMINISTRATIVE COSTS**	FREQUENCY***	DESCRIPTION/SOURCE
ALA-1A	$1,230	$44	2009 - 2030	* Personal communications with Rich Boyer from Monterey Water Management District on January 6, 2009. ** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ALA-1B	$4,910	$121		
ALA-2	$7,360	$1,420		
BUT-1	$3,680	$0		
CAL-1	$2,450	$0		
CCS-1	$6,130	$207		
CCS-2	$14,700	$1,980		
ELD-1	$3,680	$0		
LOS-1	$2,450	$0		
MEN-1	$4,910	$0		
MNT-1	$2,450	$7		
MNT-2	$7,360	$1,630		
MNT-3	$4,910	$375		
MRN-1	$1,230	$0		
MRN-2	$2,450	$0		
MRN-3	$4,910	$0		
NAP-1	$1,230	$0		
NEV-1	$4,910	$0		
PLA-1	$3,680	$218		
RIV-1	$3,680	$0		
SCZ-1	$6,130	$1,290		
SCZ-2	$3,680	$74		
SLO-1	$2,450	$124		
SLO-2	$3,680	$972		
SLO-3	$7,360	$1,010		
SLO-4	$3,680	$285		
SNB-1	$3,680	$148		
SNB-2	$1,230	$71		

UNIT	ERECTING SILT FENCING*	ADMINISTRATIVE COSTS**	FREQUENCY***	DESCRIPTION/SOURCE
SNB-3	$3,680	$260		
SNM-1	$8,590	$258		
SNM-2	$9,820	$717		
SOL-1	$1,230	$0		
SOL-2	$1,230	$0		
SOL-3	$2,450	$0		
SON-1	$2,450	$0		
SON-2	$1,230	$0		
SON-3	$2,450	$0		
STB-1	$2,450	$219		
STB-2	$2,450	$314		
STB-3	$3,680	$414		
STB-4	$2,450	$76		
STB-5	$3,680	$112		
STB-6	$3,680	$104		
STB-7	$4,910	$1,690		
STC-1	$4,910	$207		
STC-2	$7,360	$616		
VEN-1	$1,230	$123		
VEN-2	$2,450	$223		
VEN-3	$4,910	$212		
YUB-1	$2,450	$0		

EXHIBIT D-4 UNDISCOUNTED POST-DESIGNATION INCREMENTAL IMPACTS TO WATER DEVELOPMENT

UNIT	ERECTING SILT FENCING*	ADMINISTRATIVE COSTS**	FREQUENCY***	DESCRIPTION/SOURCE
ALA-1A	$0	$44	2009 - 2030	* Personal communications with Rich Boyer from Monterey Water Management District on January 6, 2009. ** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ALA-1B	$0	$121		
ALA-2	$0	$1,420		
BUT-1	$0	$0		
CAL-1	$0	$0		
CCS-1	$0	$207		
CCS-2	$0	$1,980		
ELD-1	$0	$0		
LOS-1	$0	$0		
MEN-1	$0	$0		
MNT-1	$0	$7		
MNT-2	$0	$1,630		
MNT-3	$0	$375		
MRN-1	$0	$0		
MRN-2	$0	$0		
MRN-3	$0	$0		
NAP-1	$0	$0		
NEV-1	$0	$0		
PLA-1	$0	$218		
RIV-1	$0	$0		
SCZ-1	$0	$1,290		
SCZ-2	$0	$74		
SLO-1	$0	$124		
SLO-2	$0	$972		
SLO-3	$0	$1,010		

UNIT	ERECTING SILT FENCING*	ADMINISTRATIVE COSTS**	FREQUENCY***	DESCRIPTION/SOURCE
SLO-4	$0	$285		
SNB-1	$0	$148		
SNB-2	$0	$71		
SNB-3	$0	$260		
SNM-1	$0	$258		
SNM-2	$0	$717		
SOL-1	$0	$0		
SOL-2	$0	$0		
SOL-3	$0	$0		
SON-1	$0	$0		
SON-2	$0	$0		
SON-3	$0	$0		
STB-1	$0	$219		
STB-2	$0	$314		
STB-3	$0	$414		
STB-4	$0	$76		
STB-5	$0	$112		
STB-6	$0	$104		
STB-7	$0	$1,690		
STC-1	$0	$207		
STC-2	$0	$616		
VEN-1	$0	$123		
VEN-2	$0	$223		
VEN-3	$0	$212		
YUB-1	$0	$0		

EXHIBIT D-5 UNDISCOUNTED POST-DESIGNATION BASELINE IMPACTS TO AGRICULTURE ACTIVITIES

UNIT	PROJECT MODIFICATIONS *		ADMINISTRATIVE COSTS **	EPA PESTICIDE ACTIVE INGREDIENT ASSESSMENT ***	DESCRIPTION / FREQUENCY / SOURCE
	LOW	HIGH			
BASELINE IMPACTS					
ALA-2	$191,000	$201,000	$11,300	$31,200	*** Project Modifications:** (2009-2030) **Low End**: Value of Cropland taken out of production (applying a 60 ft. buffer) **High End:** Value of Cropland taken out of production (applying a 200 ft. buffer) USDA National Agriculture Statistics Service (NASS), Census of Agriculture. Table 1: County Highlights (Market value of crops sold). Available at: http://www.agcensus.usda.gov/Publications/2002/Volume_1,_Chapter_2_County_Level/California/index.asp **** Administrative Costs of section 7 consultations:** (2009, 2010, 2011) Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. ***** EPA Pesticide Active Ingredient Assessment:** (2009) Costs are associated with staff time and data search fees. Personal communication with Arty Williams, EPA, January 13, 2009.
CCS-1	$420,000	$94,800	$1,540	$16,200	
CCS-2	$11,100,000	$11,300,000	$15,100	$1,880,000	
ELD-1	$23,400	$25,000	$620	$3,950	
MNT-1	$0	$4,930	$0	$0	
MNT-2	$1,070,000	$1,070,000	$11,700	$41,000	
MNT-3	$480,000	$480,000	$3,080	$18,300	
MRN-1	$1,830,000	$1,840,000	$879	$308,000	
MRN-2	$299,000	$285,000	$2,530	$50,500	
MRN-3	$73,100	$85,300	$3,800	$12,300	
NAP-1	$224,000	$261,000	$283	$6,960	
NEV-1	$211,000	$200,000	$927	$6,570	
RIV-1	$308,000	$317,000	$460	$41,600	
SCZ-1	$7,300,000	$7,290,000	$7,990	$171,000	
SCZ-2	$5,560,000	$5,750,000	$454	$114,000	
SLO-1	$185,000	$181,000	$2,020	$77,400	
SLO-2	$1,510,000	$1,480,000	$13,100	$630,000	
SLO-3	$1,100,000	$1,090,000	$13,400	$462,000	
SLO-4	$0	$0	$3,710	$0	
SNB-1	$498,000	$507,000	$3,420	$109,000	
SNB-2	$13,200	$13,200	$1,950	$2,900	
SNB-3	$4,790	$3,510	$7,130	$1,050	
SNM-1	$438,000	$466,000	$3,530	$18,700	
SNM-2	$3,020,000	$3,200,000	$10,500	$129,000	
SOL-1	$1,260	$1,410	$1,020	$854	
SOL-2	$219	$649	$216	$149	
SOL-3	$521,000	$598,000	$253	$16,200	
SON-1	$8,020	$8,300	$175	$5,440	
SON-2	$132	$393	$184	$89	

UNIT	PROJECT MODIFICATIONS *		ADMINISTRATIVE COSTS **	EPA PESTICIDE ACTIVE INGREDIENT ASSESSMENT ***	DESCRIPTION / FREQUENCY / SOURCE
	LOW	HIGH			
BASELINE IMPACTS					
SON-3	$251,000	$261,000	$250	$52,400	
STB-2	$495,000	$521,000	$4,040	$40,200	
STB-3	$0	$0	$5,120	$0	
STB-5	$0	$0	$1,030	$0	
STB-6	$613,000	$598,000	$1,310	$49,800	
STB-7	$0	$0	$12,700	$0	
STC-1	$1,240,000	$1,220,000	$5,600	$45,300	
STC-2	$860,000	$824,000	$17,600	$32,200	
VEN-1	$1,030,000	$1,090,000	$323	$39,800	
VEN-3	$309,000	$304,000	$420	$11,900	

EXHIBIT D-6 UNDISCOUNTED POST-DESIGNATION INCREMENTAL IMPACTS TO AGRICULTURE ACTIVITIES

UNIT	PROJECT MODIFICATIONS *		ADMINISTRATIVE COSTS **	EPA PESTICIDE ACTIVE INGREDIENT ASSESSMENT ***	DESCRIPTION / FREQUENCY / SOURCE
	LOW	HIGH			
INCREMENTAL IMPACTS					
ALA-2	$20,500	$24,500	$3,760	$0	* **Project Modifications:** (2009-2030)
CCS-1	$47,500	$51,100	$515	$0	
CCS-2	$725,000	$756,000	$5,040	$0	**Low End:** Value of Cropland taken out of production (applying a 60 ft. buffer)
ELD-1	$93,700	$109,000	$207	$0	
MNT-1	$0	$0	$0	$0	**High End:** Value of Cropland taken out of production (applying a 200 ft. buffer)
MNT-2	$415,000	$418,000	$3,900	$0	
MNT-3	$1,030	$1,030	$1,030	$0	USDA National Agriculture Statistics Service (NASS), Census of Agriculture. Table 1: County Highlights (Market value of crops sold). Available at: http://www.agcensus.usda.gov/Publications/2002/Volume_1,_Chapter_2_County_Level/California/index.asp
MRN-1	$547,000	$592,000	$293	$0	
MRN-2	$3,080,000	$3,260,000	$844	$0	
MRN-3	$48,900	$83,600	$1,270	$0	
NAP-1	$3,050	$10,400	$95	$0	
NEV-1	$129,000	$183,000	$309	$0	
RIV-1	$153	$153	$153	$0	
SCZ-1	$1,290,000	$1,380,000	$2,670	$0	
SCZ-2	$142,000	$212,000	$152	$0	** **Administrative Costs of section 7 consultations:** (2009, 2010, 2011)
SLO-1	$128,000	$146,000	$674	$0	
SLO-2	$1,110,000	$1,140,000	$4,380	$0	Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation.
SLO-3	$1,100,000	$1,140,000	$4,460	$0	
SLO-4	$92,600	$95,300	$1,240	$0	
SNB-1	$272,000	$310,000	$1,140	$0	
SNB-2	$650	$650	$650	$0	
SNB-3	$324,000	$327,000	$2,380	$0	
SNM-1	$238,000	$330,000	$1,180	$0	
SNM-2	$1,280,000	$1,390,000	$3,520	$0	
SOL-1	$18,300	$26,100	$341	$0	
SOL-2	$424,000	$442,000	$72	$0	
SOL-3	$88,800	$108,000	$84	$0	
SON-1	$59	$59	$59	$0	

UNIT	PROJECT MODIFICATIONS *		ADMINISTRATIVE COSTS **	EPA PESTICIDE ACTIVE INGREDIENT ASSESSMENT ***	DESCRIPTION / FREQUENCY / SOURCE
	LOW	HIGH			
INCREMENTAL IMPACTS					
SON-2	$61	$61	$61	$0	
SON-3	$3,740	$4,240	$84	$0	
STB-2	$183,000	$194,000	$1,350	$0	
STB-3	$26,000	$27,900	$1,710	$0	
STB-5	$121,000	$124,000	$344	$0	
STB-6	$294,000	$311,000	$437	$0	
STB-7	$402,000	$402,000	$4,250	$0	
STC-1	$424,000	$447,000	$1,870	$0	
STC-2	$886,000	$1,010,000	$5,860	$0	
VEN-1	$110,000	$118,000	$108	$0	
VEN-3	$129,000	$156,000	$140	$0	

EXHIBIT D-7 UNDISCOUNTED POST-DESIGNATION INCREMENTAL IMPACTS TO GRAZING ACTIVITIES

UNIT	ADMINISTRATIVE COSTS *	FREQUENCY **	SOURCE
INCREMENTAL IMPACTS			
ALA-1A	$11,600	2009-2030	* Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. ** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ALA-1B	$32,300		
ALA-2	$488,000		

EXHIBIT D-8 UNDISCOUNTED POST-DESIGNATION BASELINE AND INCREMENTAL IMPACTS TO TIMBER MANAGEMENT

UNIT	REVIEW OF TIMBER HARVEST PLANS BY CAL FIRE*	CAL FIRE TIMBER HARVEST COSTS**	ADMIN COSTS OF SECTION 7 CONSULTATIONS ***	FREQUENCY ****	SOURCE
BASELINE IMPACTS					
BUT-1	$293	$78,900	$15,300	2009-2030	* Chris Browder, CAL FIRE, January 9, 2009 ** Chris Browder, CAL FIRE, January 9, 2009 *** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. **** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ELD-1	$41	$0	$8,210		
NEV-1	$129	$4,720	$17,900		
YUB-1	$564	$0	$11,800		
PLA-1	$0	$0	$8,040		
INCREMENTAL IMPACTS					
BUT-1	$0	$0	$232	2009-2030	*** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. **** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ELD-1	$0	$0	$125		
NEV-1	$0	$0	$272		
PLA-1	$0	$0	$122		
YUB-1	$0	$0	$179		

EXHIBIT D-9 UNDISCOUNTED POST-DESIGNATION BASELINE AND INCREMENTAL IMPACTS TO TRANSPORTATION ACTIVITIES

SUBUNIT	ASSORTED PROJECT COSTS *		ADMIN COSTS OF SECTION 7 CONSULTATIONS**	FREQUENCY ***	DESCRIPTION / SOURCE
	LOW	HIGH			
BASELINE IMPACTS					
CCS-2	$166,000	$597,800	$30,400	2009, 2010	* **Assorted Project Costs:** **Low End:** $53,000 - Estimated Bank Credits, In-Lieu, Conservation Easements, and Coop Agreements $0 - Avoidance and Minimization Efforts $25,000 - Habitat Creation and Restoration $5,000 - Monitoring **High End:** $159,000 - Estimated Bank Credits, In-Lieu, Conservation Easements, and Coop Agreements $9,750 - Avoidance and Minimization Efforts $80,000 - Habitat Creation and Restoration $50,000 - Monitoring FHWA - California Division - Endangered Species Act Annual Impact and Mitigation Report Submittal. Forwarded by Amy Pettler, Senior Endangered Species Coordinator and Wildlife Biologist, California Department of Transportation Division of Environmental Analysis, on January 5, 2009. ** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
MNT-2	$249,000	$896,700	$45,600	2009, 2010	
SCZ-1	$83,000	$298,900	$15,200	2030	
SCZ-2	$83,000	$298,900	$15,200	2030	
SLO-3	$83,000	$298,900	$15,200	2009	
STB-5	$83,000	$298,900	$15,200	2011	

SUBUNIT	ASSORTED PROJECT COSTS *		ADMIN COSTS OF SECTION 7 CONSULTATIONS**	FREQUENCY ***	DESCRIPTION / SOURCE
	LOW	HIGH			
INCREMENTAL IMPACTS					
CCS-2	$0	$0	$7,600	2009, 2010	** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
MNT-2	$0	$0	$11,400	2009, 2010	
SCZ-1	$0	$0	$3,800	2030	
SCZ-2	$0	$0	$3,800	2030	
SLO-3	$0	$0	$3,800	2009	
STB-5	$0	$0	$3,800	2011	

EXHIBIT D-10 UNDISCOUNTED POST-DESIGNATION BASELINE AND INCREMENTAL IMPACTS TO UTILITY AND OIL & GAS PIPELINE CONSTRUCTION AND MAINTENANCE

UNIT (NUMBER OF FORECAST PROJECTS)	PROJECT MODIFICATION COSTS*		ADMIN COSTS OF SECTION 7 CONSULTATIONS**	FREQUENCY ***	DESCRIPTION / SOURCE
	LOW	HIGH			
BASELINE IMPACTS					
ALA-2 (2)	$2,857	$11,405	$30,400	2009-2030	* **Project Modification Costs** **Low End:** $0 - Avoidance and Minimization Efforts $25,000 - Habitat Creation and Restoration $5,000 - Monitoring **High End:** $9,750 - Avoidance and Minimization Efforts $80,000 - Habitat Creation and Restoration $50,000 - Monitoring FHWA - California Division - Endangered Species Act Annual Impact and Mitigation Report Submittal. Forwarded by Amy Pettler, Senior Endangered Species Coordinator and Wildlife Biologist, California Department of Transportation Division of Environmental Analysis, on January 5, 2009 ** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
CCS-1 (1)	$1,429	$5,702	$15,200		
CCS-2 (3)	$4,286	$17,107	$45,600		
MNT-2 (1)	$1,429	$5,702	$15,200		
SCZ-1 (1)	$1,429	$5,702	$15,200		
SLO-1 (2)	$2,857	$11,405	$30,400		
SLO-2 (1)	$1,429	$5,702	$15,200		
SLO-3 (2)	$2,857	$11,405	$30,400		
SNB-2 (1)	$1,429	$5,702	$15,200		
SNB-3 (1)	$1,429	$5,702	$15,200		
SNM-1 (1)	$1,429	$5,702	$15,200		
SOL-1 (1)	$1,429	$5,702	$15,200		
SOL-2 (1)	$1,429	$5,702	$15,200		
SOL-3 (1)	$1,429	$5,702	$15,200		
STB-2 (1)	$1,429	$5,702	$15,200		
STB-5 (2)	$2,857	$11,405	$30,400		
STB-6 (2)	$2,857	$11,405	$30,400		
STB-7 (1)	$1,429	$5,702	$15,200		
STC-1 (1)	$1,429	$5,702	$15,200		
STC-2 (1)	$1,429	$5,702	$15,200		
VEN-1 (1)	$1,429	$5,702	$15,200		
VEN-3 (2)	$2,857	$11,405	$30,400		

UNIT (NUMBER OF FORECAST PROJECTS)	PROJECT MODIFICATION COSTS*		ADMIN COSTS OF SECTION 7 CONSULTATIONS**	FREQUENCY ***	DESCRIPTION / SOURCE
	LOW	HIGH			
INCREMENTAL IMPACTS					
ALA-2 (2)	$0	$0	$7,600	2009-2030	** **Administrative Costs of section 7 consultations:** Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation.
CCS-1 (1)	$0	$0	$3,800		
CCS-2 (3)	$0	$0	$11,400		
MNT-2 (1)	$0	$0	$3,800		
SCZ-1 (1)	$0	$0	$3,800		*** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
SLO-1 (2)	$0	$0	$7,600		
SLO-2 (1)	$0	$0	$3,800		
SLO-3 (2)	$0	$0	$7,600		
SNB-2 (1)	$0	$0	$3,800		
SNB-3 (1)	$0	$0	$3,800		
SNM-1 (1)	$0	$0	$3,800		
SOL-1 (1)	$0	$0	$3,800		
SOL-2 (1)	$0	$0	$3,800		
SOL-3 (1)	$0	$0	$3,800		
STB-2 (1)	$0	$0	$3,800		
STB-5 (2)	$0	$0	$7,600		
STB-6 (2)	$0	$0	$7,600		
STB-7 (1)	$0	$0	$3,800		
STC-1 (1)	$0	$0	$3,800		
STC-2 (1)	$0	$0	$3,800		
VEN-1 (1)	$0	$0	$3,800		
VEN-3 (2)	$0	$0	$7,600		

EXHIBIT D-11 UNDISCOUNTED POST-DESIGNATION BASELINE AND INCREMENTAL IMPACTS TO FIRE MANAGEMENT

SUBUNIT	CAL FIRE FUEL MANAGEMENT COSTS *	ADMIN COSTS OF SECTION 7 CONSULTATIONS **	FREQUENCY ***	SOURCE
BASELINE IMPACTS				
BUT-1	$23,800	$0	2009-2030	* Chris Browder, CAL FIRE, January 9, 2009. ** Administrative Costs of section 7 consultations: $15,200 per consultation Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
NEV-1	$1,420	$0		
LOS-1	$0	$17,900		
VEN-2	$0	$2,550		
INCREMENTAL IMPACTS				
LOS-1	$0	$5,970	2009-2030	** **Administrative Costs of section 7 consultations:** $3,800 per consultation Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. *** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
VEN-2	$0	$851		
NEV-1	$0	$48,900		
PLA-1	$0	$21,900		

EXHIBIT D-12 UNDISCOUNTED POST-DESIGNATION BASELINE IMPACTS TO SPECIES MANAGEMENT

SUBUNIT	MONITORING & DATABASE MANAGEMENT *	ADMIN COSTS OF SECTION 7 CONSULTATIONS **	FREQUENCY ***	SOURCE
BASELINE IMPACTS				
BUT-1	$4,234	$0	2009-2030	* Tina Mark, Tahoe National Forest, January 7, 2009.
ELD-1	$7,500	$0		
NEV-1	$5,180	$0		** **Administrative Costs of section 7 consultations**
PLA-1	$2,320	$0		
YUB-1	$3,266	$0		$15,200 per consultation Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation.
ALA-1A	$0	$2		
ALA-1B	$0	$5		
ALA-2	$0	$138		
CCS-1	$0	$9		*** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
CCS-2	$0	$83		
LOS-1	$0	$538		
MNT-1	$0	$4		
MNT-2	$0	$1,061		
MNT-3	$0	$249		
MRN-1	$0	$111		
MRN-2	$0	$322		
MRN-3	$0	$485		
SCZ-1	$0	$5,901		
SCZ-2	$0	$345		
SLO-1	$0	$1,035		
SLO-2	$0	$834		
SLO-3	$0	$901		
SLO-4	$0	$271		
SNB-1	$0	$88		
SNB-2	$0	$42		
SNB-3	$0	$155		
SNM-1	$0	$20		

SUBUNIT	MONITORING & DATABASE MANAGEMENT *	ADMIN COSTS OF SECTION 7 CONSULTATIONS **	FREQUENCY ***	SOURCE
BASELINE IMPACTS				
SNM-2	$0	$128		
SON-3	$0	$11		
STB-1	$0	$376		
STB-2	$0	$504		
STB-3	$0	$711		
STB-4	$0	$122		
STB-5	$0	$182		
STB-6	$0	$170		
STB-7	$0	$2,514		
STC-1	$0	$19		
STC-2	$0	$217		
VEN-1	$0	$120		
VEN-2	$0	$677		
VEN-3	$0	$206		

EXHIBIT D-13 UNDISCOUNTED POST-DESIGNATION INCREMENTAL IMPACTS TO SPECIES MANAGEMENT

SUBUNIT	MONITORING & DATABASE MANAGEMENT *	ADMIN COSTS OF SECTION 7 CONSULTATIONS **	FREQUENCY ***	SOURCE
INCREMENTAL IMPACTS				
ALA-1A	$0	$1	2009-2030	** **Administrative Costs of section 7 consultations:** $3,800 per consultation Based on a review of the historical consultation frequency in the areas proposed for critical habitat from 1996-2008 and administrative costs of consultation. ***** Unless attributed to a specific year, listed costs are spread over the 22-year time horizon of the analysis (occurring annually). Costs may also be arrayed spatially depending on the overlay of the activity within the study area.
ALA-1B	$0	$2		
ALA-2	$0	$46		
CCS-1	$0	$3		
CCS-2	$0	$28		
LOS-1	$0	$179		
MNT-1	$0	$1		
MNT-2	$0	$354		
MNT-3	$0	$83		
MRN-1	$0	$37		
MRN-2	$0	$107		
MRN-3	$0	$162		
SCZ-1	$0	$1,967		
SCZ-2	$0	$115		
SLO-1	$0	$345		
SLO-2	$0	$278		
SLO-3	$0	$300		
SLO-4	$0	$91		
SNB-1	$0	$29		
SNB-2	$0	$14		
SNB-3	$0	$52		
SNM-1	$0	$7		
SNM-2	$0	$43		
SON-3	$0	$4		
STB-1	$0	$125		
STB-2	$0	$168		

SUBUNIT	MONITORING & DATABASE MANAGEMENT *	ADMIN COSTS OF SECTION 7 CONSULTATIONS **	FREQUENCY ***	SOURCE
INCREMENTAL IMPACTS				
STB-3	$0	$237		
STB-4	$0	$41		
STB-5	$0	$61		
STB-6	$0	$57		
STB-7	$0	$838		
STC-1	$0	$6		
STC-2	$0	$72		
VEN-1	$0	$40		
VEN-2	$0	$226		
VEN-3	$0	$69		

APPENDIX E | TECHNICAL INFORMATION FOR IMPACTS ON URBAN DEVELOPMENT

248. This appendix provides more detail concerning the estimated urban development impacts. The first section explains the procedure for projecting household, population, and acre growth in the study area. Next, the analysis explains how economic values were forecast based on these projections.

E.1 PROJECTED DEVELOPMENT IN PROPOSED CRITICAL HABITAT

249. This section of the appendix explains how the analysis projects household, population, and acreage growth in the areas of critical habitat. Specifically, this section of the report explains the analysis behind Exhibits 4-4.

E.1.1 SCAG AND SANDAG PROJECTIONS

250. To determine the increase in the number of new housing units within the study area, this analysis relies on growth projection data available through local planning authorities. Ideally this analysis would use census tracts as the geographic unit of analysis. The census tract is the finest level of distinction at which the applicable data are published. Predicting growth at the smallest geographic unit possible is important because local or even neighborhood-level characteristics can be responsible for a high degree of heterogeneity in the effects of habitat conservation. A unit-level analysis may not be sensitive enough to discern any noticeable effects even though the effects are large on a smaller scale.

251. However, the study area for this analysis extends across 28 counties from Mendocino and Butte Counties in the north to Riverside County in the south. As a result, available data varies significantly across the study area. For example, while the Association of Bay Area Governments (ABAG) and the Southern California Association of Governments (SCAG) provide growth projection data through 2030 at the census tract level, local planning authorities in other regions of California provide 2030 population and housing growth projections at geographic levels larger than census tracts:

- Sacramento Council of Governments (SACOG) (including Yuba, Placer and El Dorado counties) forecasts growth at the Regional Analysis District, or RAD.[188]

[188] SACOG growth projections obtained from http://www.sacog.org/demographics/pophsg, electronic communication with Associate Research Analyst, SACOG, January 7, 2009. Associated GIS shapefiles obtained from http://www.sacog.org/mapping/clearinghouse.

- The Association of Monterey Bay Area Governments (AMBAG) forecasts growth for incorporated and unincorporated regions of Santa Cruz, San Benito, and Monterey counties.[189]
- San Luis Obispo Council of Governments (SLOCOG) delineates "planning areas" which generally correspond to city boundaries and unincorporated areas to project population growth.[190]
- Santa Barbara County Association of Governments (SBCAG) projects population growth at the Census County Division, or CCD, a formal US Census Bureau boundary.[191]

252. For areas that provide housing and population projections at geographic units larger than census tracts, this analysis uses the average density in each county to translate available housing data to acres at the census tract level. Average density (households per acre) in each county is calculated by dividing the number of households obtained from the California Department of Finance by the number of acres classified as "urbanized" by the California Farmland Mapping and Monitoring Program.[192]

253. Growth projections in Butte, Nevada, Calaveras, Mendocino, San Joaquin, Stanislaus, Merced, and Kern Counties were obtained from Applied Geographic Solutions (AGS).[193] AGS forecasts population and households at the census tract level for the entire state of California through the year 2018. Linear growth was assumed to extrapolate projections through 2030.

E.1.2 BEC GROWTH ALLOCATION MODEL

254. The next step for projecting number of new housing units in the study area is to spatially allocate projected growth within each census tract. It is important not to assume growth will occur uniformly within each census tract because such an assumption, which is almost always untrue would cause a mis-attribution of development within the study area. This would happen because the boundary of critical habitat does not usually match that of census tracts. Certain areas of proposed critical habitat may be unsuitable for development; conserving this habitat will not result in any additional costs. The assumption of uniform development would erroneously attribute development (and

[189] AMBAG growth projections obtained from http://www.ambag.org/publications/reports/2004%20Forecast/Forecast%20Results.pdf. Associated GIS shapefiles obtained from electronic communication with GIS Associate, AMBAG, January 5, 2009.

[190] SLOCOG growth projections obtained from electronic communication with Transportation Planner III, SLOCOG, December 18, 2008. Associated GIS shapefiles obtained from electronic communication with Transportation Planner. SLOCOG, January 6, 2009.

[191] SBCAG growth projections obtained from http://www.sbcag.org/PDFs/publications/ReginalGrowthforecastComplete%20Final.pdf. Associated GIS shapefiles obtained from http://www.census.gov/geo/www/cob/cs_metadata.html#ccd.

[192] For the SLOCOG and SBCAG data, household size was also needed to forecast housing growth from population growth. Data from AGS were used to determine average household size for San Luis Obispo and Santa Barbara counties.

[193] Electronic communication with Sr. Vice President, Applied Geographic Solutions, January 8, 2009. For more information, see http://www.appliedgeographic.com/about_ags.html

conservation costs) to these areas. Conversely, conserved habitat may occupy the last portions of undeveloped land within a tract, meaning the majority of future development in a census tract will be projected to occur within the species' habitat. These scenarios illustrate the need for more precise growth allocation.

255. Allocating growth within each census tract requires modeling the process of the conversion of undeveloped land into an urban landscape (which the analysis refers to as "Greenfield development"). This analysis utilizes a growth allocation model created by BEC.

256. This statistical model incorporates both spatial and non-spatial data to project urban growth in California. Its explanatory variables include demand variables, pertaining to job accessibility and income level; location-specific variables, such as freeway proximity, whether the land is classified as farmland, and whether it lies in a flood-plain; neighborhood variables, modeling the geography of a location's neighbors; and regulatory variables, such as whether a location is in an incorporated city.

257. The land use forecasting model analyzes the State by dividing it into a matrix of grid cells. It outputs a probabilistic score (between 0 and 1) that a given cell will be converted from undeveloped to developed within the next 22 years. For each census tract, the sum of the probabilistic scores within the critical habitat area is divided by the sum of the probabilistic scores within the census tract to determine the share of development within the tract that is projected to occur within the area of critical habitat.

E.2 VALUE OF DEVELOPED LAND

258. The next step for estimating conservation impacts for urban development involves using the current value of developed land to estimate a value for undeveloped land, and then applying these values to the development forecast in the previous section. The current value of developed land is estimated by evaluating the following equation:

$$v = \frac{p - k}{\lambda}$$

259. This equation implies that the value of developed land (v) is equal to the difference between the selling price of a new house (p) and the cost of developing the new house (k), divided by (λ), the inverse density (acres per house).[194] The result is the per acre dollar value of the lot with no structures on it. The methodology used to estimate each of these parameters is discussed below.

[194] To verify the estimated land values, a simple regression was run of the land value on the mean vacant land values, without a constant and with robust standard errors. The results show that the variable is significant with a t value of 11.24, a coefficient of 0.679, and an R square of 0.4187. Data on vacant land transactions were obtained from DataQuick for all census tracts that were in the 2001 or 2006 critical habitat designation. Sales prices were inflated to real dollars using the OFHEO home price index. The mean per acre value of vacant land by census tract was used.

E.2.1 NEW HOME SALE PRICE (p)

260. Data on the selling prices of new homes were obtained from DataQuick Information Systems, which maintains a database of new home transactions in the study area. Based on information gathered from county recorders and assessors, the database provides a rich set of house descriptors, including assessor's parcel number, census tract, home size, lot size, number of stories, number of bedrooms, number of bathrooms, build year, sale price, and sale date for all transactions dating back to 1993. Each observation is spatially referenced by census tract using a geographic information system (GIS).

261. Because California home prices have roughly tripled in the past decade, the nominal sale prices reported by DataQuick are not directly comparable across time. The prices were inflated to real dollars using the Office of Federal Housing Enterprise Oversight's home price index. This index provides quarterly data on price inflation for detached, single-family dwellings by metropolitan statistical area (MSA).

E.2.1 HOME DEVELOPMENT COST (k)

262. The cost of development includes construction costs, design costs, and local development impact fees. Construction costs include labor and materials. Design costs include architecture, grading, utilities, and the provision of common space. Development impact fees include utility hookup charges and other local charges. Data on the cost of construction were obtained from Marshall & Swift, which publishes a quarterly guide to building cost per square foot indexed by region, construction quality (average, good, very good, or excellent), and home size. New homes were assumed to be one story, stud-framed with stucco siding and of either average or good construction quality, which is typical for newly constructed tract homes. The design cost is assumed to be equal to twenty percent of the cost of construction. Development impact fees (which include local fees such as utility hookups and are included in the cost of house development) were collected from the engineering and planning departments in the local governments across California.[195] An average development impact fee for the State was assumed equal to 20 percent of the development build costs, which vary by region.[196]

E.2.1 INVERSE DENSITY (λ)

263. The inverse density of development (acres per house) represents the number of acres developed divided by the number of houses built. Because available data varies across the study area, the following sections summarize the variables and methodology used to estimate this parameter by geographic region.

264. For the majority of counties, density was estimated used a four-step process:[197]

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[195] This analysis assumes a utility hookup fee of $10,000 per acre based on interviews conducted in 2007 and 2008 with planning departments in 12 cities, including Brisbane, Chula Vista, Highlands, Hemet, Morgan Hill, Palo Alto, Redlands, Redwood City, San Jose, San Mateo, Temecula, San Bernardino.

[196] Personal communication with California Home Builders Association of Northern California, 2004.

[197] Including Butte, El Dorado, Kern, Kings, Merced, Monterey, Nevada, Placer, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Cruz, Stanislaus, Ventura, and Yuba.

- **Step 1**. Define the area within each county that is classified as "urbanized" based on GIS data from the California Farmland Mapping and Monitoring Program (FMMP).[198]
- **Step 2**. Estimate the percent of the "urbanized" area that is covered by development, including homes, sidewalks, parks, and greenways based on visual inspection of aerial photography of a random sample of points within the urbanized area.[199]
- **Step 3**. Estimate the total area developed by multiplying the acres in the "urbanized" area by the percent of the "urbanized" area that is covered by development.
- **Step 4**. Generate the average gross density in each county by dividing the total developed area (in acres) by the number of homes obtained from the California Department of Finance.[200]

265. For the remaining counties, alternative data were available resulting in the following geographic-specific methodologies:

- **Association of Bay Area Governments (ABAG) Region**.[201] Density for the ABAG region was obtained directly from ABAG projections by dividing number of houses by developed acres.
- **Riverside and Los Angeles Counties**. Density in Riverside and Los Angeles counties was estimated from the lot size variable in DataQuick because there were a sufficient number of single family home sales observations to provide a reliable county average lot size; 1,385 observations in Riverside and 535 observations in Los Angeles.
- **Calaveras and Mendocino Counties**. Neither FMMP nor DataQuick data were available for Calaveras and Mendocino counties. In the absence of these data, this analysis estimates density in these counties based on the density calculated for the nearest county (Nevada County).

266. All of this information was then used to calculate the value of developable land by county. Since land values for property that has already been developed can be calculated from observations on the prices of existing houses, and price information for vacant lots is much more difficult to obtain, the developed land values were used to estimate the value of currently vacant land. The land values for acres projected to be developed sometime in the next 22 years are estimated to be equal to the value of land supporting existing development, but discounted across the number of years before that new development is projected to take place. The result is the price a developer would pay

[198] California Farmland Mapping and Monitoring Program. http://www.conservation.ca.gov/ dlrp/fmmp/Pages/Index.aspx.

[199] National Agriculture Imagery Program. http://165.221.201.14/NAIP.html. Imagery freely available at http://casil.ucdavis.edu/casil/imageryBaseMapsLandCover/imagery/naip_2005/.

[200] California Department of Finance, County/State Population and Housing Estimates, Revised January 1, 2007.

[201] Including Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara Solano, and Sonoma.

today for land that will not be developed immediately (e.g., because the land is located at a distance from leading edge of existing development activity or necessary infrastructure).

EXHIBIT E-1 CURRENT VALUE OF DEVELOPABLE LAND PER ACRE IN THE STUDY AREA